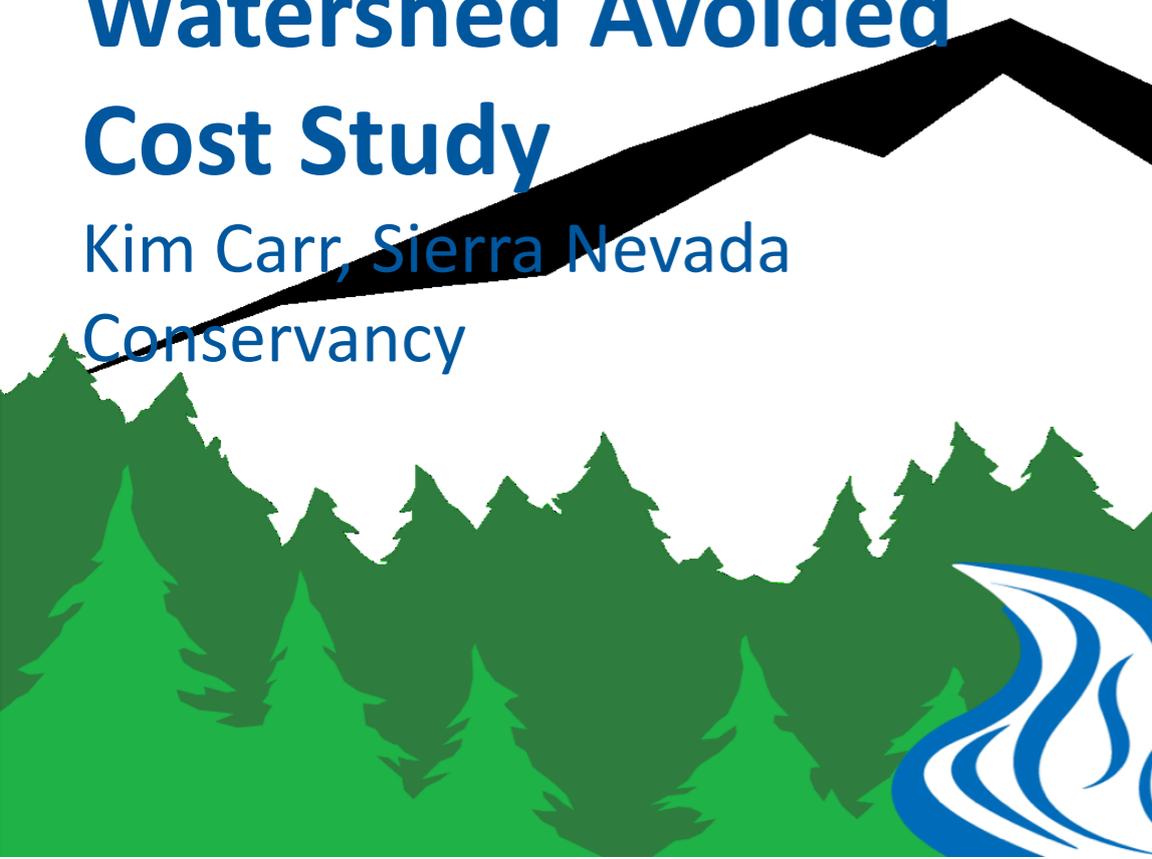


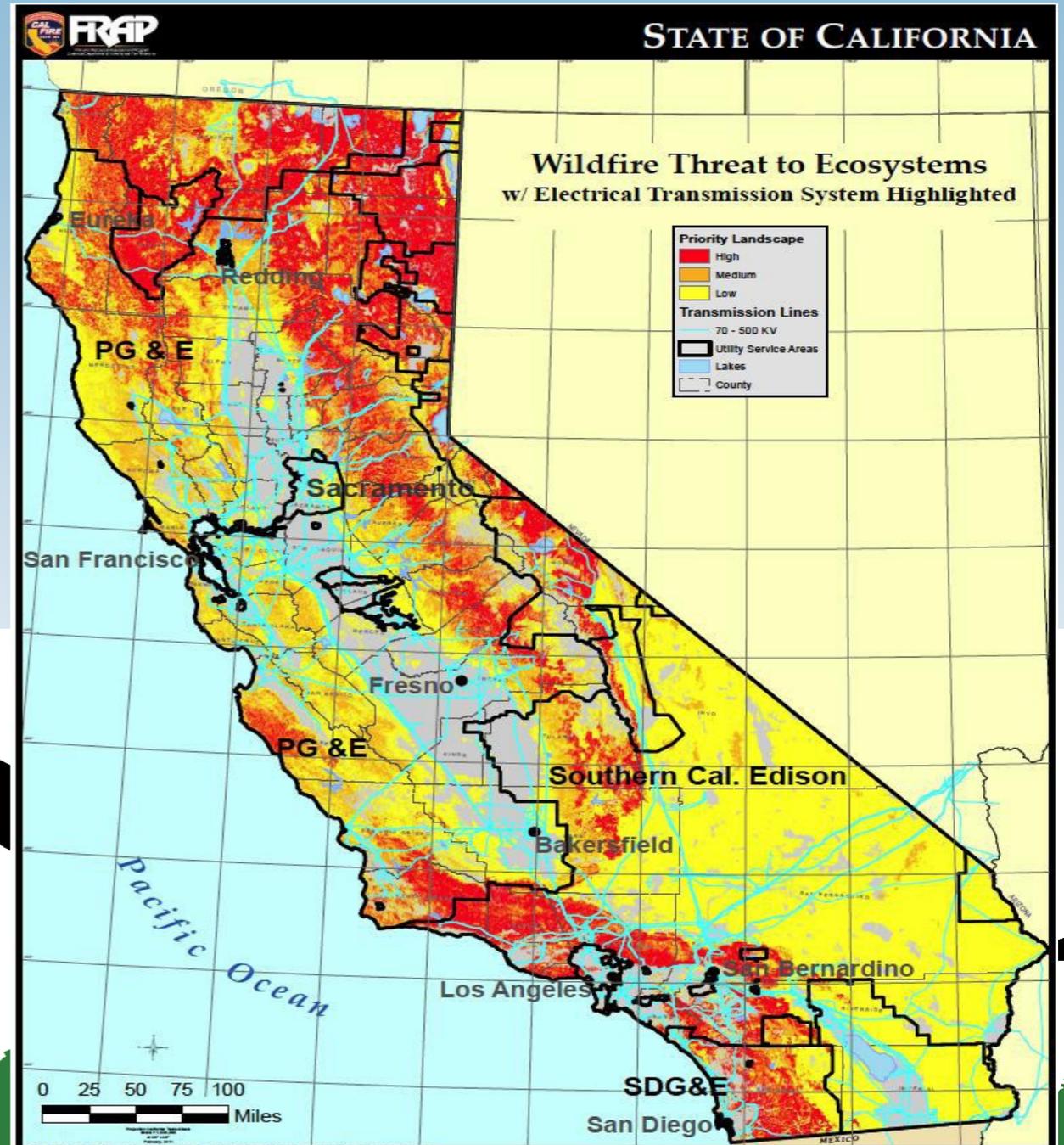
# Mokelumne Watershed Avoided Cost Study

Kim Carr, Sierra Nevada  
Conservancy



# Sierra Nevada Conservancy

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





# Water and Fire

## California's Sierra Nevada - Your Source of Water

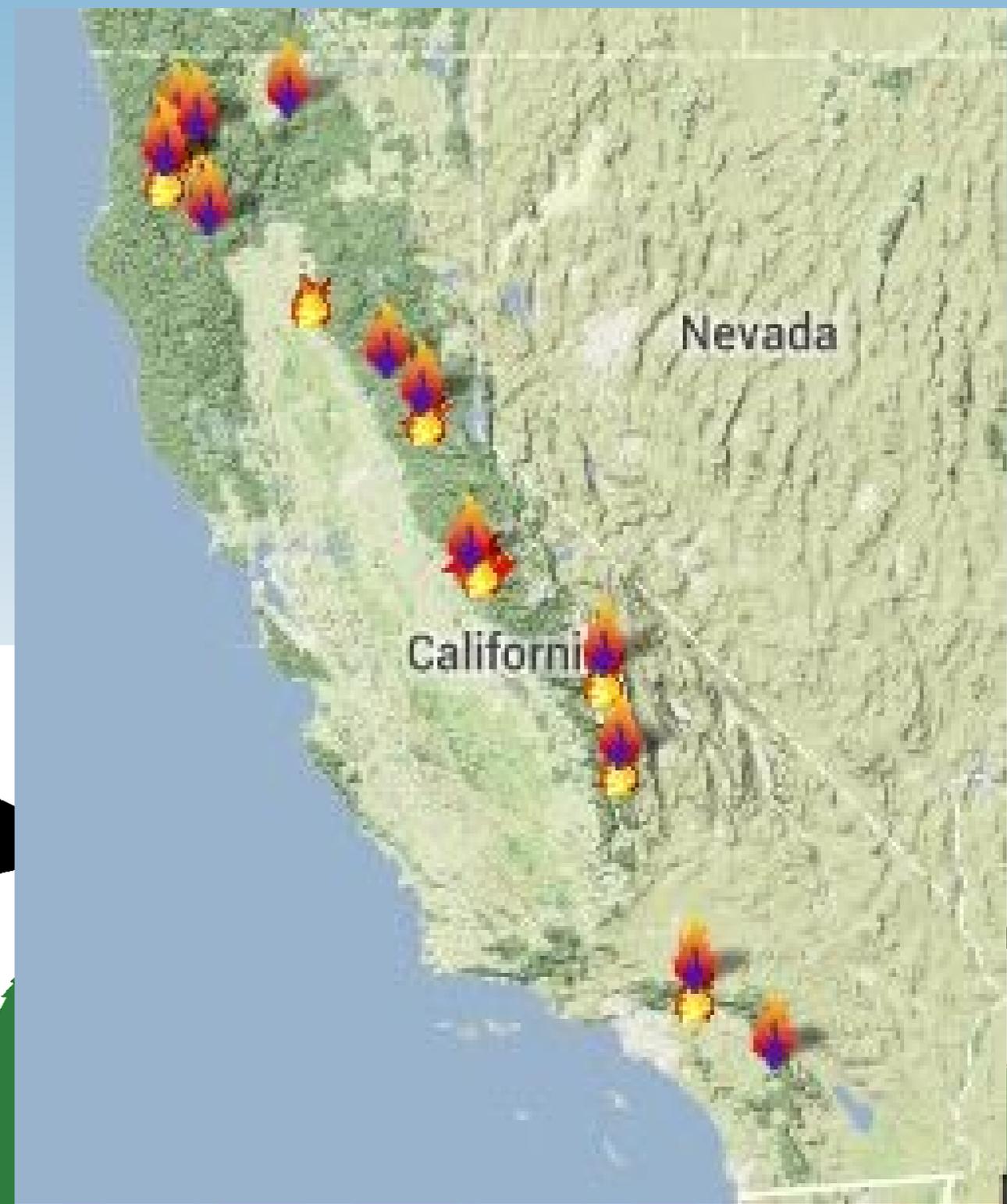
California's instate water supply mainly comes from the Sierra Nevada and southern Cascade mountains. The map shows the range of water yield throughout the state, water that is potentially available for use. The highest amount of water yield is depicted in dark and lighter blue and the more arid areas are shades of beige.

The naturally wet areas of California support and sustain the dry areas. The map shows the primary end users of the water by use of the faucet icon.



Data Sources:  
California Water Yield: The Nature Conservancy  
Water Sources & Destinations: Calwater  
Shaded Relief: ESRI ArcGIS Online  
Urban Areas: ESRI Data and Maps

Prepared by: Sierra Nevada Conservancy



# Untreated & Treated Forest Area



Calaveras County

**San Francisco Chronicle**

**Yosemite fire shows water  
resources at risk**

**Los Angeles Times**

**Cost of battling massive Rim fire  
hits \$100 million**

# San Jose Mercury News

BAY AREA NEWS GROUP

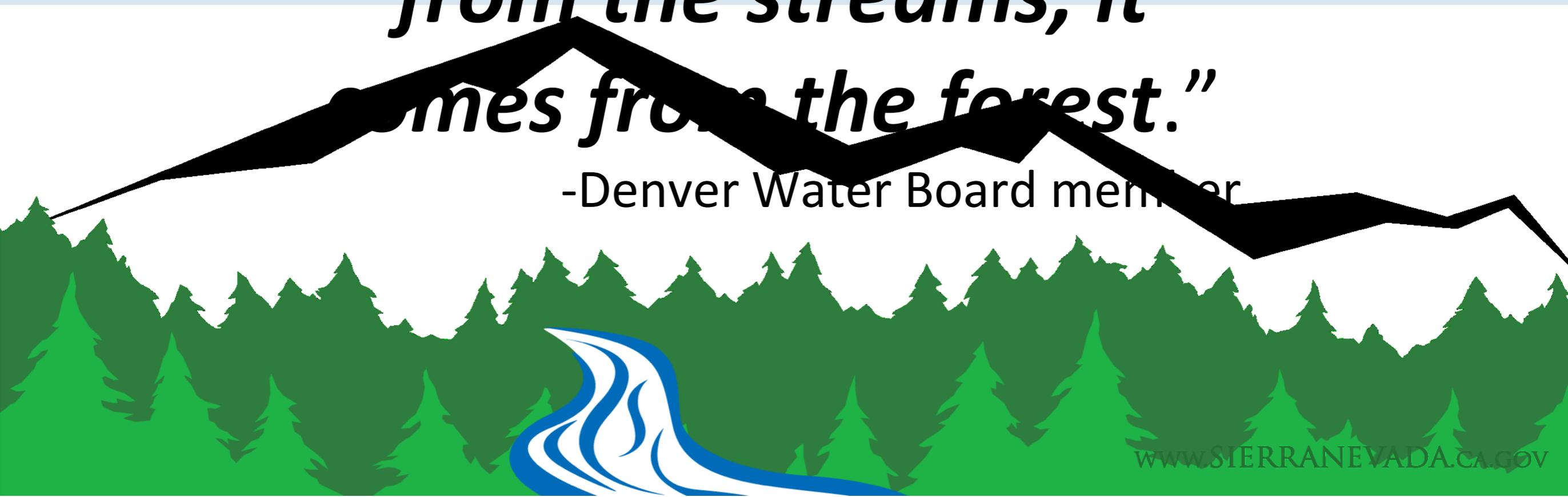
Rim fire: Disaster shows need to invest in Sierra forests and California's water supply



Don Bartletti Los Angeles Times

***“We’ve realized the water does not come from the streams, it comes from the forest.”***

-Denver Water Board member



# Mokelumne Watershed Avoided Cost Analysis

To answer the question –

Does it make economic sense to increase investment in fuel treatments to reduce the risk of large, damaging wildfires?



# Partners

## Planning Team:

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

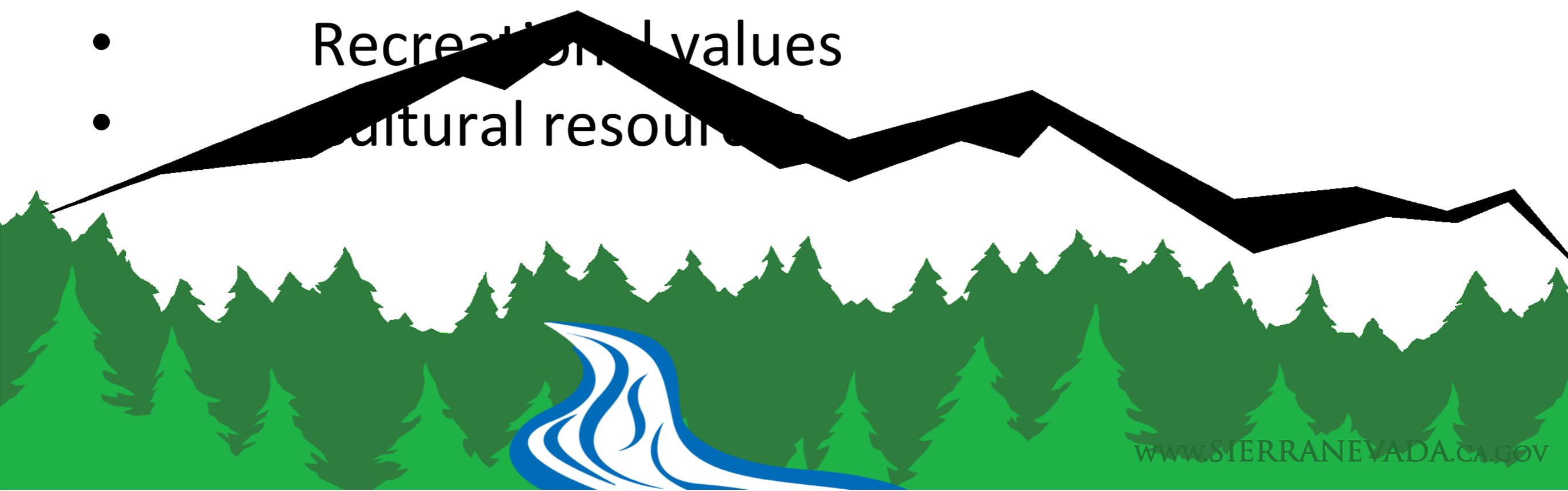


# Primary Goals of the Project

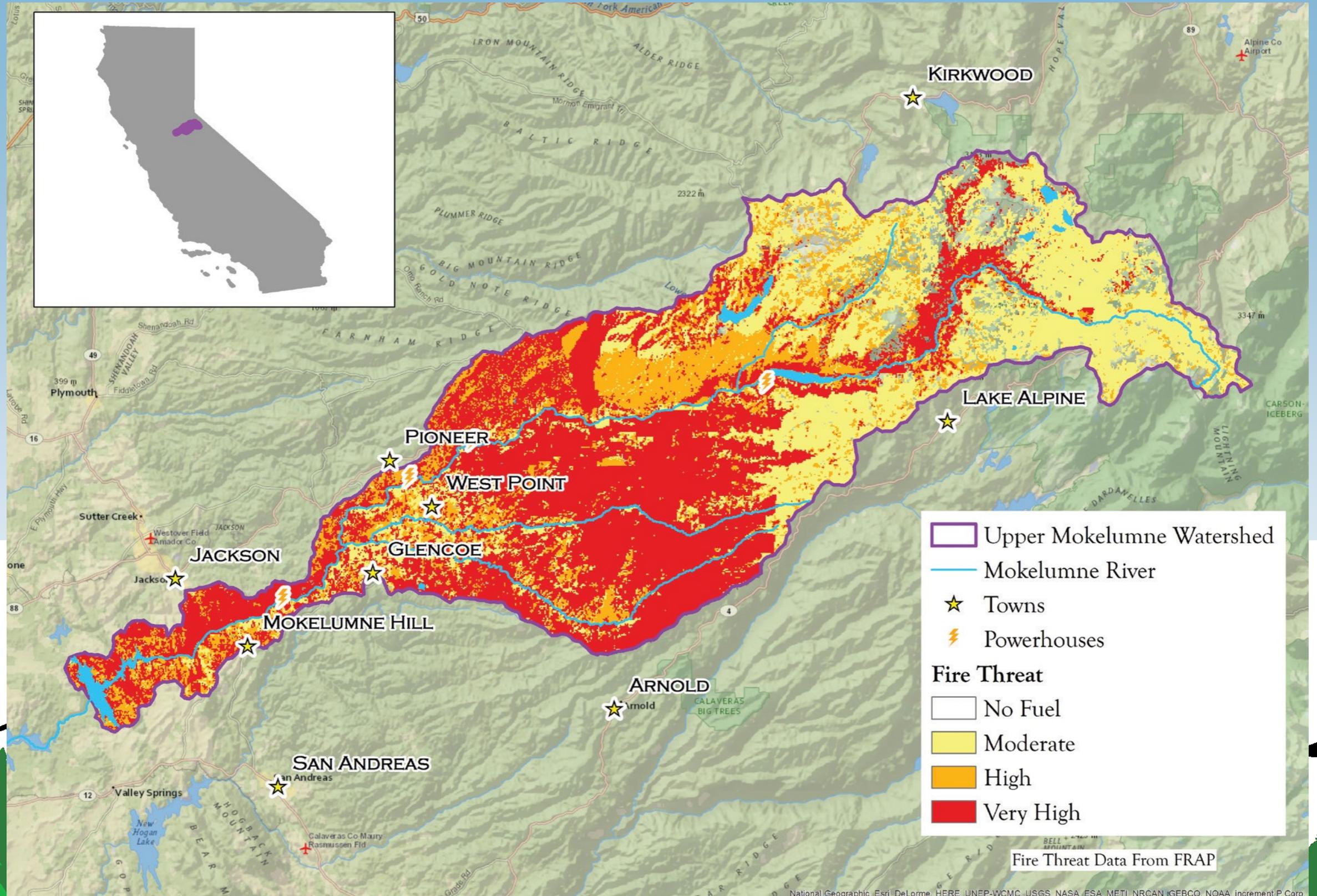
- Calculate the avoided costs of implementing forest treatments to reduce fire risk compared to paying costs associated with wildfire.
- Through collaboration, identify project treatments and locations that show multiple benefits.
- Encourage new investment in forest treatment to increase pace and scale and reduce fire risk.
- New investment/investors.
- Education – link headwaters to water users/rate payers

# Costs Not Included

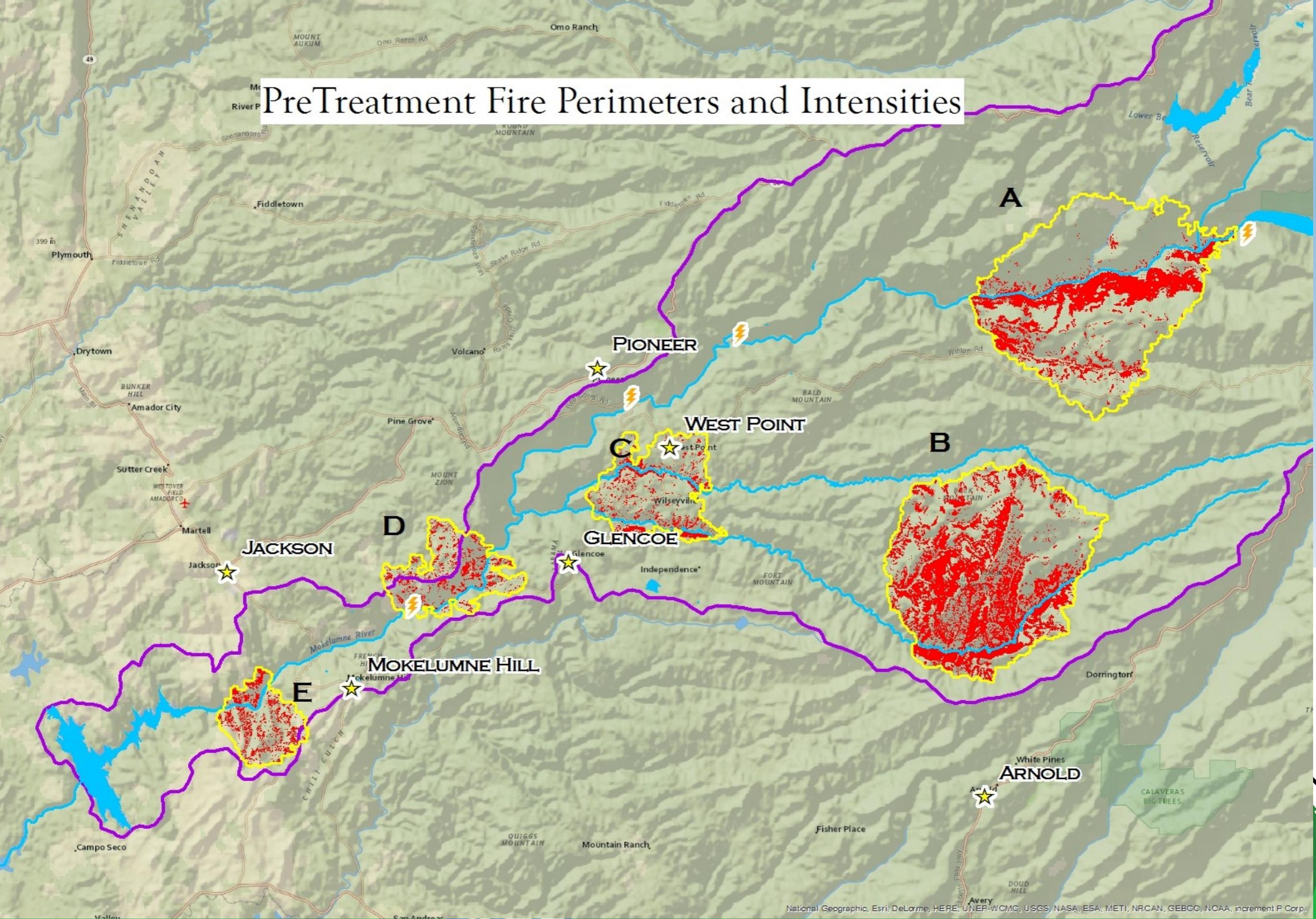
- Water yield and quality
- Air quality
- Pollination
- Habitat and biodiversity
- Aesthetic values
- Recreational values
- Cultural resources



# Upper Mokelumne River Watershed



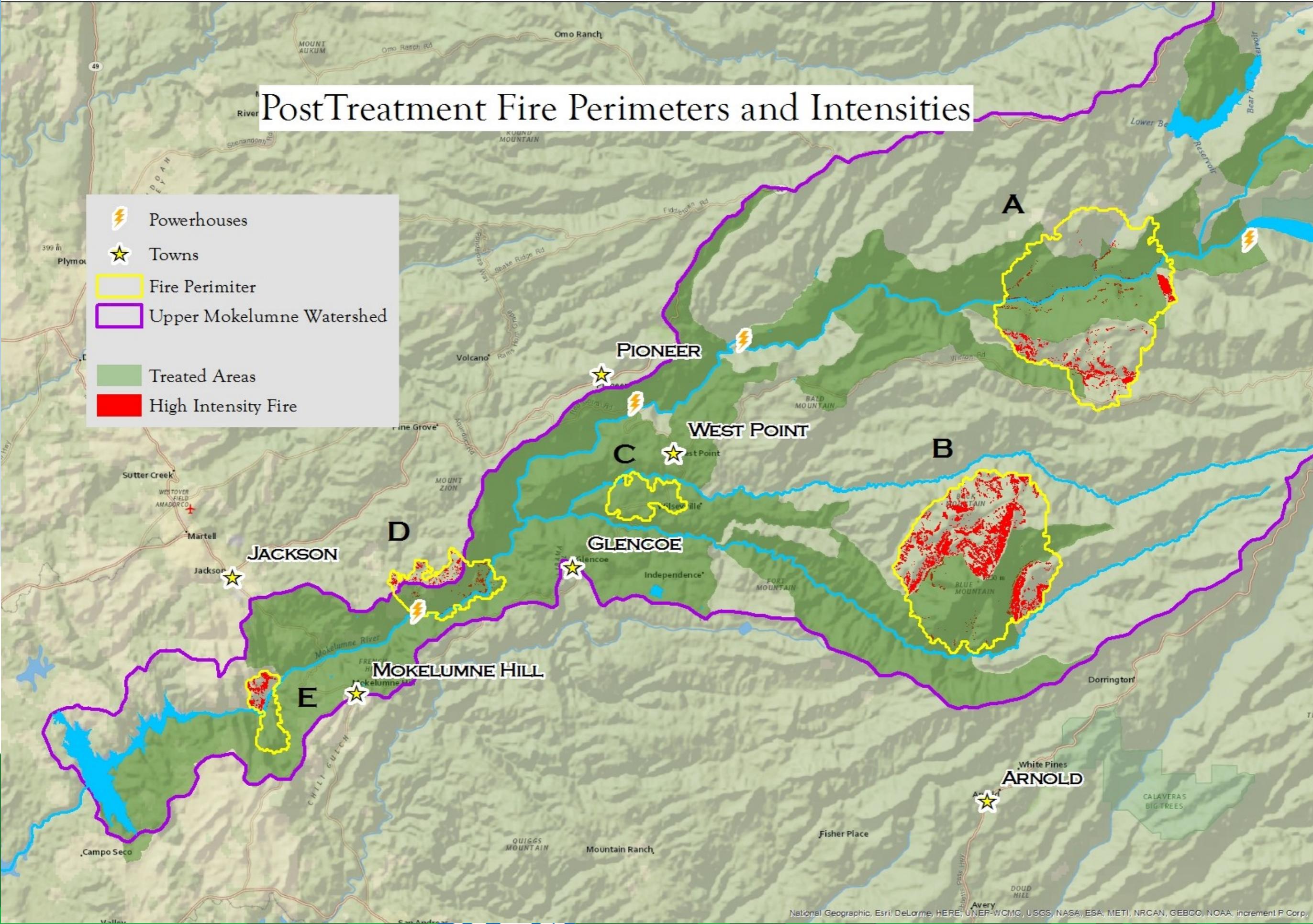
# PreTreatment Fire Perimeters and Intensities



National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

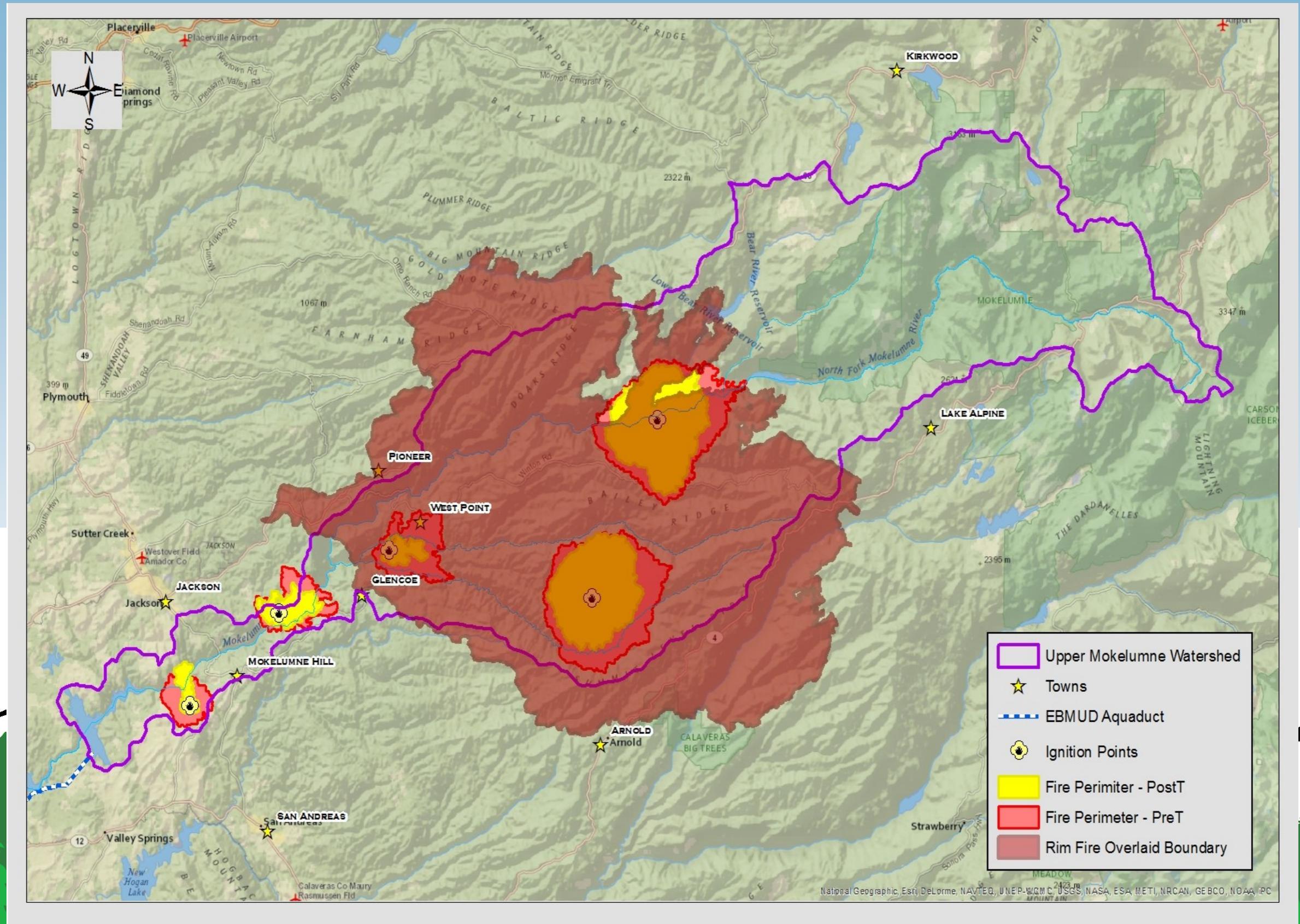
# Post Treatment Fire Perimeters and Intensities

- ⚡ Powerhouses
- ★ Towns
- ▭ Fire Perimeter
- ▭ Upper Mokelumne Watershed
- ▭ Treated Areas
- ▭ High Intensity Fire



National Geographic, Esri, DeLorme, HERE, UNER-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

# Rim Fire Boundary and Modeled Wildfires

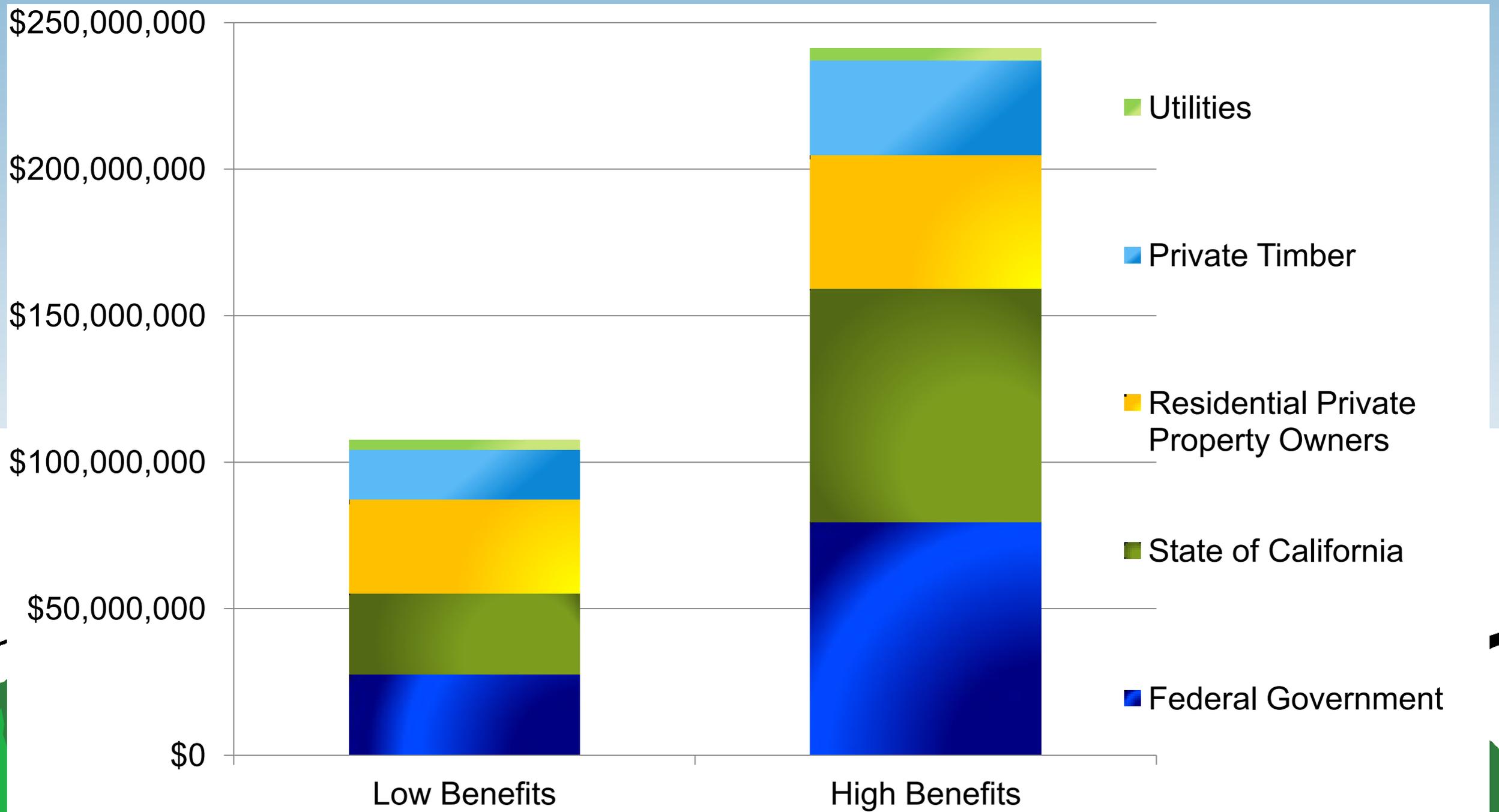


# Costs and Benefits of Modeled Fuel Treatments

<b>Costs</b>		
Fuel Treatment	\$68,000,000	\$68,000,000
<b>Benefits</b>		
	Low	High
Structures Saved	\$32,000,000	\$45,600,000
Avoided Fire Cleanup	\$22,500,000	\$22,500,000
Carbon Sequestered	\$19,000,000	\$71,000,000
Merchantable Timber from Treatment	\$14,000,000	\$27,000,000
Avoided Suppression	\$12,500,000	\$20,800,000
Biomass from Treatment	\$12,000,000	\$21,000,000
Avoided Road Repairs and Reconstruction	\$10,630,000	\$10,630,000
Transmission Lines Saved	\$1,600,000	\$1,600,000
Timber Saved	\$1,200,000	\$3,130,250
Avoided Sediment for Utilities (water supply)	\$1,000,000	\$1,000,000
<b>Total Benefits</b>	<b>\$126,430,000</b>	<b>\$224,260,250</b>

Figure ES-3. Total Costs and Benefits for Fuel-Treatments Scenario

# Fuel Treatment Beneficiaries



# 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