Planning for Growth and Open Space Conservation

This webinar series is sponsored by:
USDA Forest Service
State and Private Forestry - Cooperative Forestry

Organized by
Susan Stein, Sara Comas, Susan Guynn (Clemson University)
and the
Forest Service National Open Space Conservation Group

June 25, 2014

This webinar is being recorded

Audio is Streamed Through the Computer

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Session #13: City and County Open Space Programs

This program presents growth and open space conservation planning for cities and counties. Speakers will present the Trust for Public Land's Conservation Almanac and LandVote resources that are available online for researching conservation activities, and public funding for land conservation. We will also learn about open space conservation planning processes, ordinances, funding mechanisms, and partnerships employed in Missoula, Montana, and Baltimore County, Maryland.

- **Mary Bruce Alford** Trust for Public Land
- **Jackie Corday** City of Missoula, Montana
- **Don Outen** Baltimore County, Maryland

Link to video presentation
Link to PDF Presentation
Link to resources from this webinar

Session #12: Greening Grey Infrastructure: Federal Highway Administration's Eco-Logical Approach and Case Studies from National Forests in Ohio and Washington

Session #11: An All Lands Approach to Ecosystem Services for Water

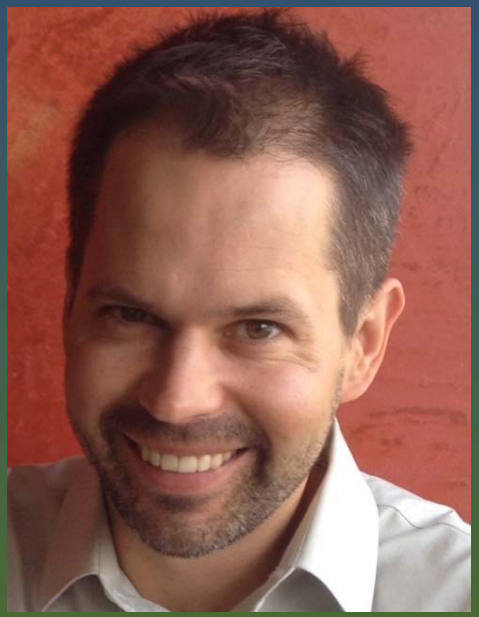
Session #10: Tools for Conservation Planning

Webinar Resources and Tools

Find relevant resources for each webinar session here!
If you have relevant resources to share please send them to us!

Session #25:
Making the Economic Case for Conservation

Kim Carr
State of California
Sierra Nevada
Conservancy



Mark Buckley
ECONorthwest

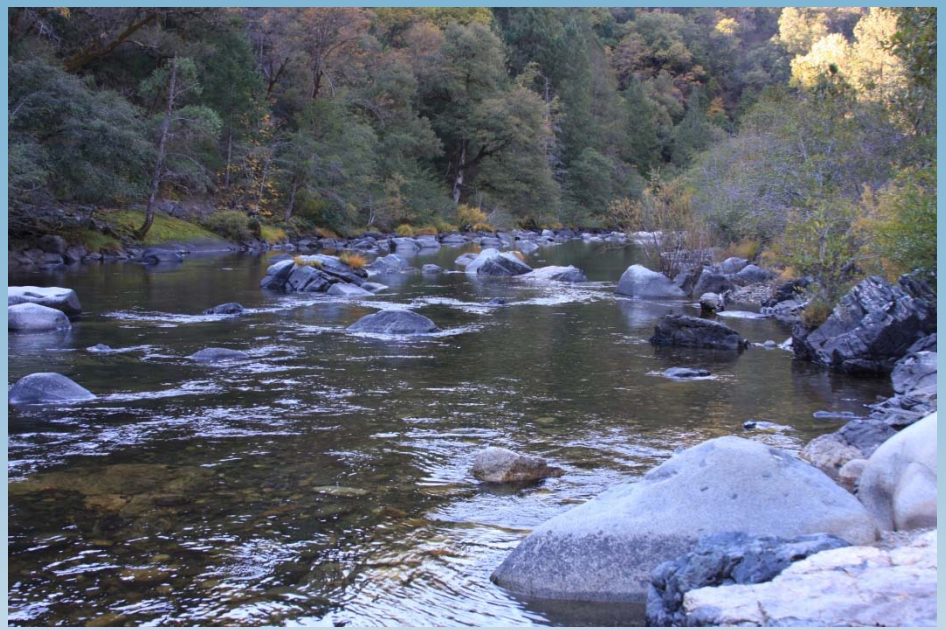
Tim Ramirez
San Francisco Public Utilities
Commission

Logistics – Q&A

- **Continuing Education Credits**
  - Attend **entire** presentation (including Q&A)
- **Questions for speakers – chat pod**
- **Technical difficulties – chat pod or email Susan Guynn: SGUYNN@clemson.edu**

Getting to Know You!

Kim Carr
State of California
Sierra Nevada
Conservancy



Mokelumne Watershed Avoided Cost Analysis

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

"We've realized the water does not come from the streams, it comes from the forest."

-Denver Water Board member

Why An Avoided Cost Analysis?

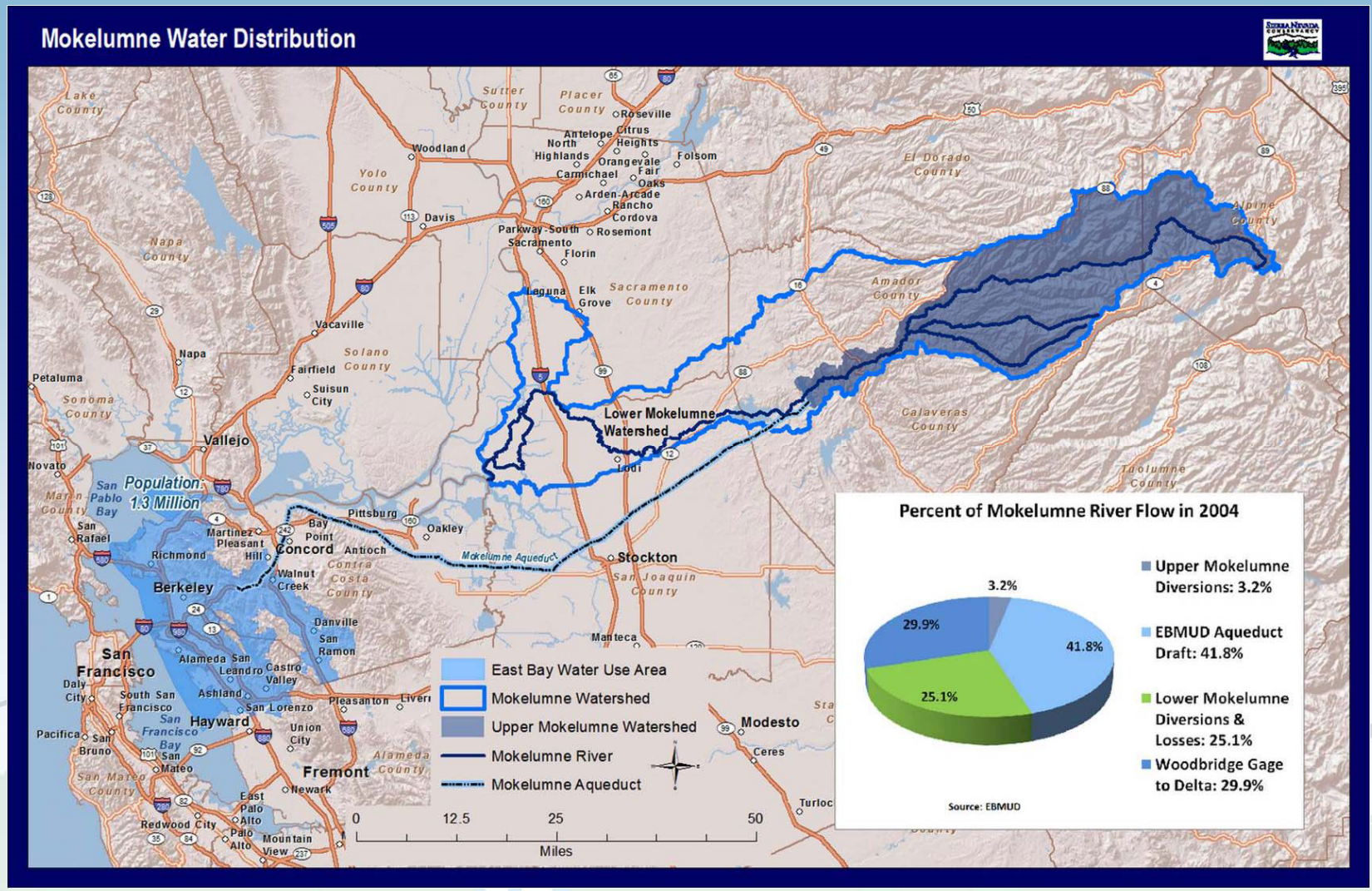
To answer the question –

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

What is the focus of the Avoided Cost Analysis?

Calculate the avoided costs of implementing forest treatments to reduce fire risk compared to paying costs associated with wildfire.

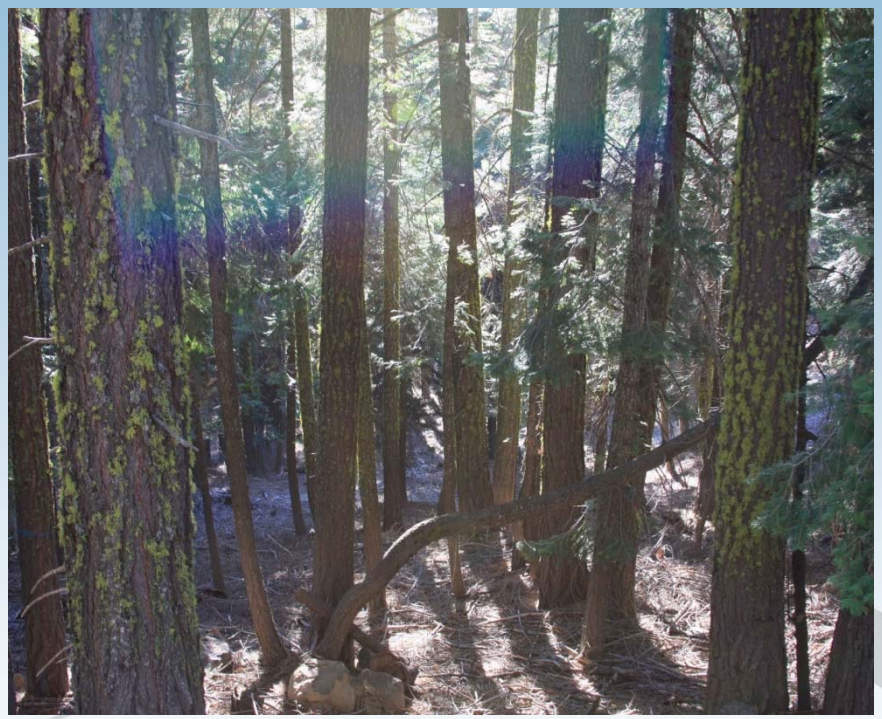
Mokelumne Water Distribution



Primary Goals of the Project

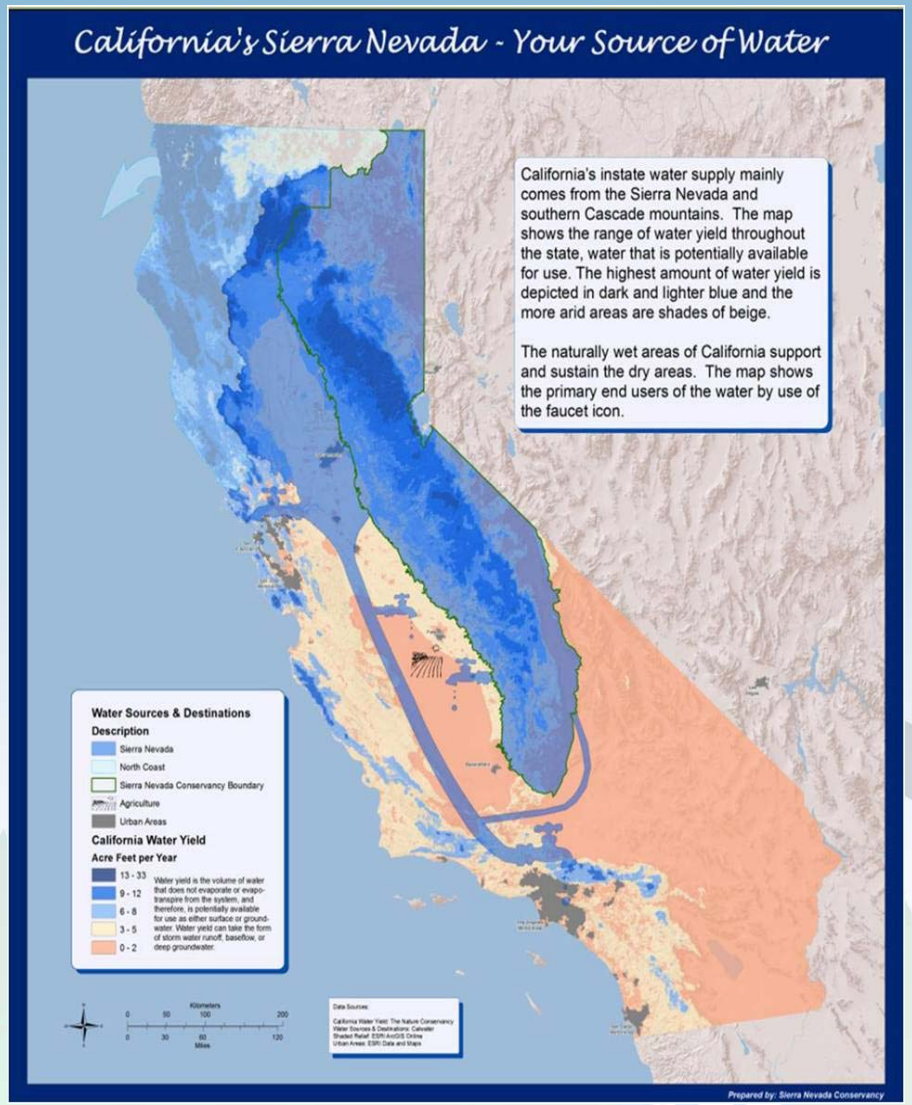
- Through collaboration, identify forest treatments and locations that show multiple benefits.
- Encourage new investment in forest treatment to increase pace and scale and reduce fire risk.
- Identify new investment/investors.
- Education – link headwaters to water users/rate payers

Untreated & Treated Forest Area



Amador County

Water and Fire



From Inciweb.org – August 2013

Don Bartletti Los Angeles Times

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

Partners

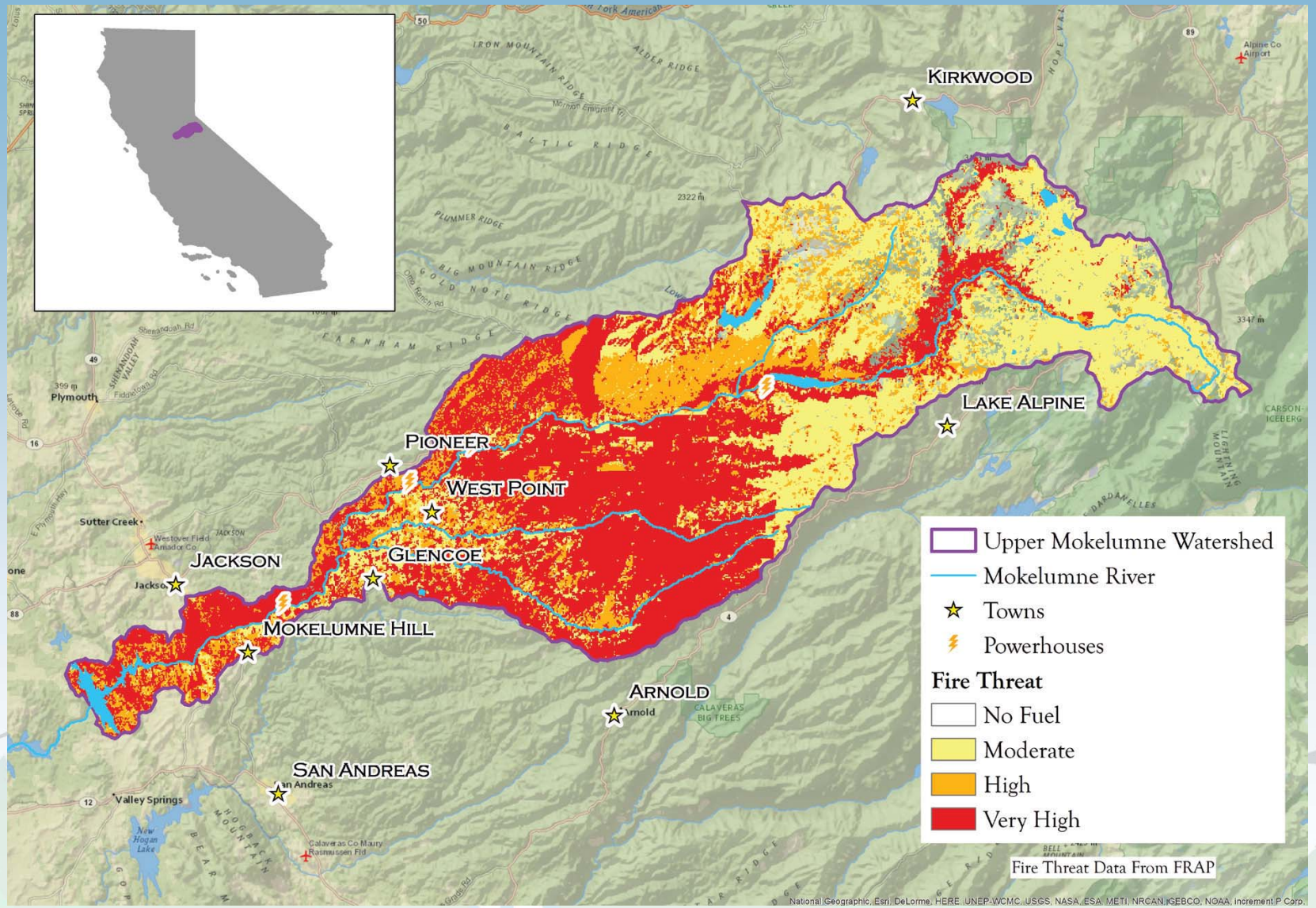
Planning Team:

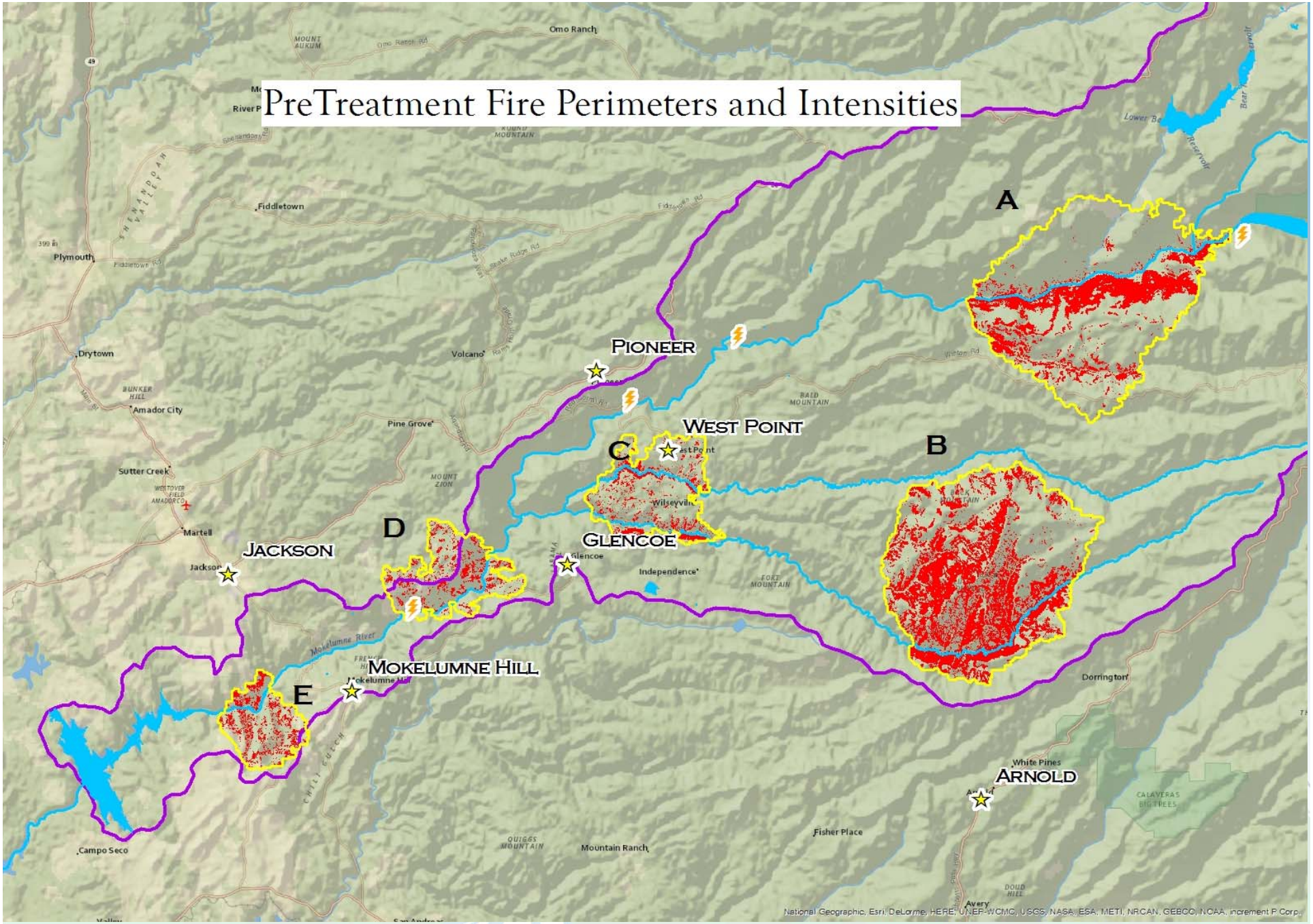
- US Forest Service Region 5
- Sierra Nevada Conservancy
- The Nature Conservancy

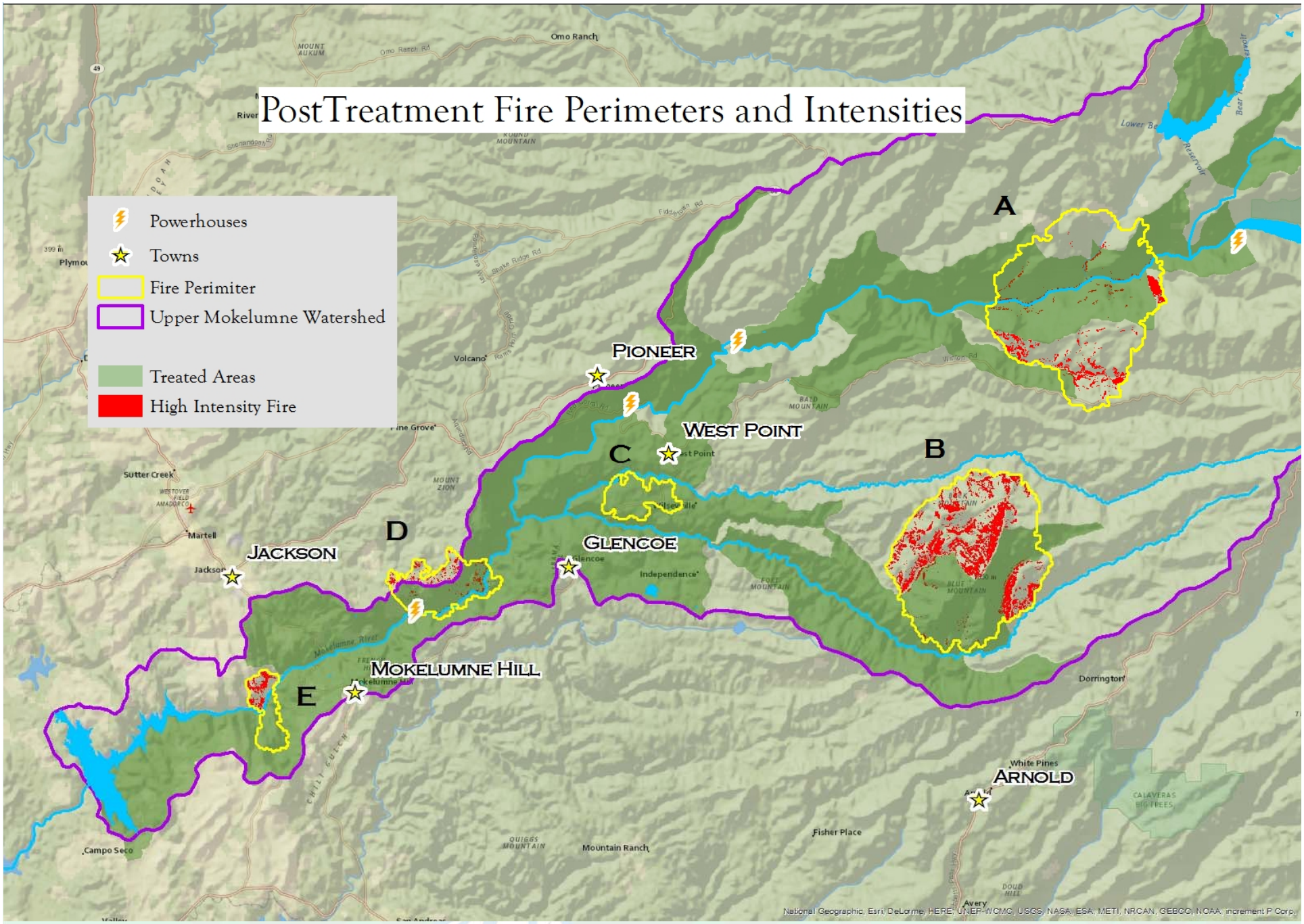
Advisory and Technical Teams:

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

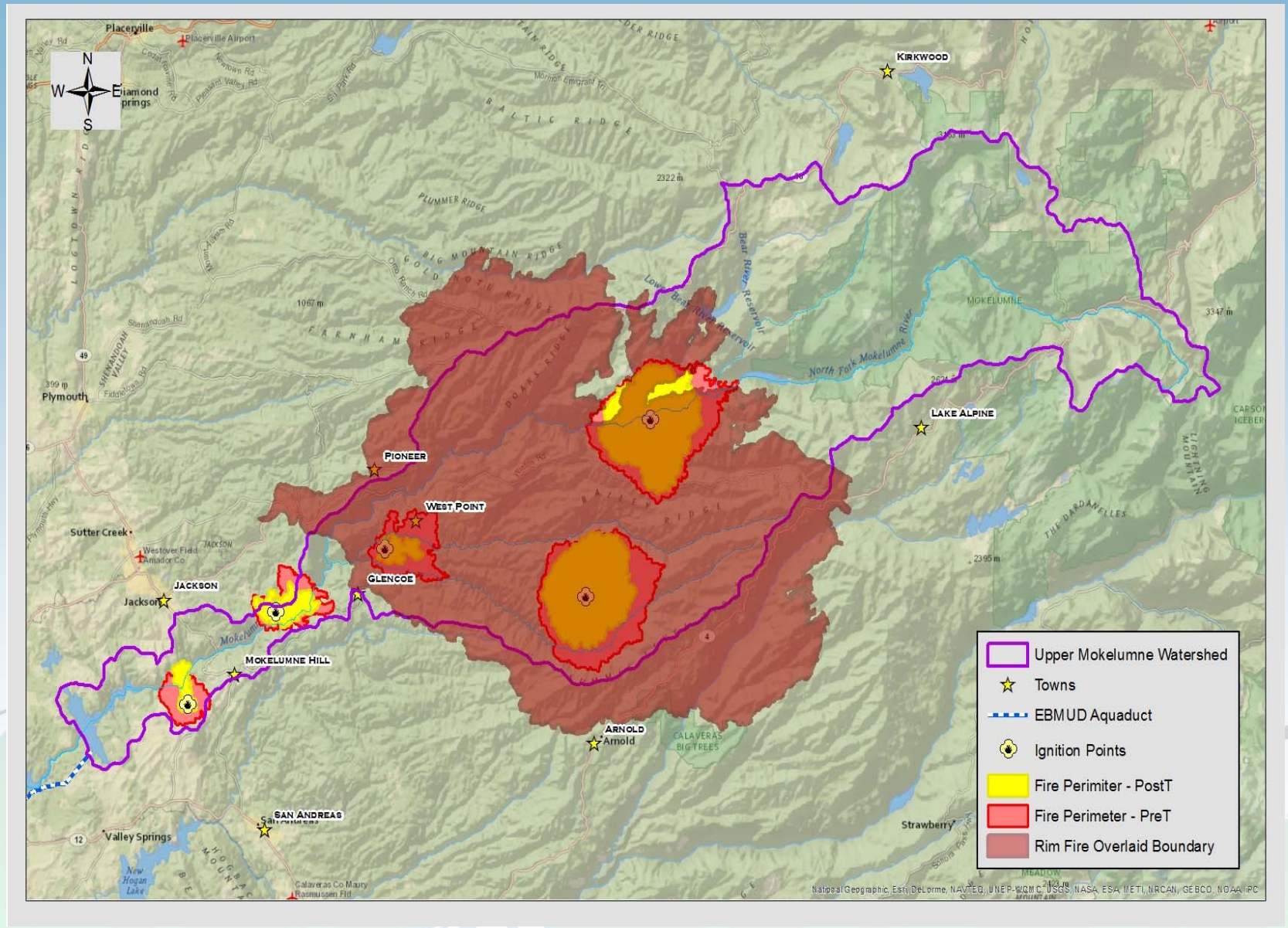
Upper Mokelumne River Watershed




PreTreatment Fire Perimeters and Intensities
A
B
C
D
E
PIONEER
WEST POINT
GLENCOE
JACKSON
MOKELUMNE HILL
ARNOLD
Omo Ranch
Fiddletown
Plymouth
Drytown
Volcano
Amador City
Pine Grove
Sutter Creek
Martell
Jackson
Wilseyville
Glencoe
Independence
Dorrington
White Pines
Fisher Place
Mountain Ranch
Campo Seco
Avery
National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp


PostTreatment Fire Perimeters and Intensities
Powerhouses
Towns
Fire Perimiter
Upper Mokelumne Watershed
Treated Areas
High Intensity Fire
A
B
C
D
E
PIONEER
WEST POINT
GLENCOE
JACKSON
MOKELUMNE HILL
ARNOLD
Omo Ranch
Volcano
Pine Grove
Sutter Creek
Martell
Jackson
Independence
Dorrington
White Pines
Fisher Place
Mountain Ranch
Campo Seco
National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

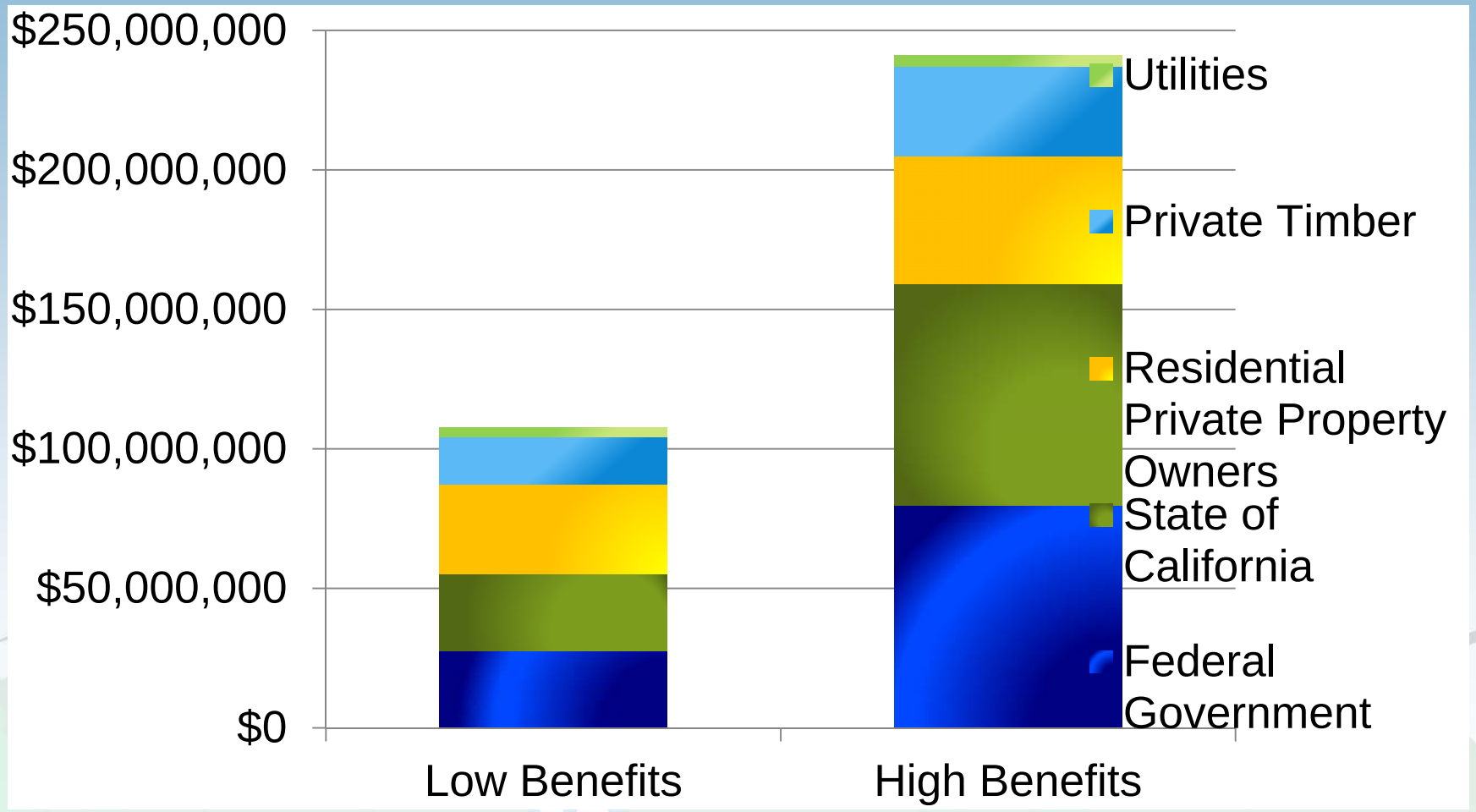
Rim Fire Boundary and Modeled Wildfires



Costs and Benefits

Costs		
Fuel Treatment	$16,000,000	$68,000,000
Benefits	*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
Total Benefits	*$126,430,000*	*$224,260,250*

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

Welcome to the National Forest Foundation *Special Projects Donation Page.*

Mokelumne Watershed Fund

Action Since Report Release

- Large media coverage
- Briefings to:
  - Federal Agencies
  - California Congressional staff
  - California State legislator's
  - East Bay Municipal Utility District

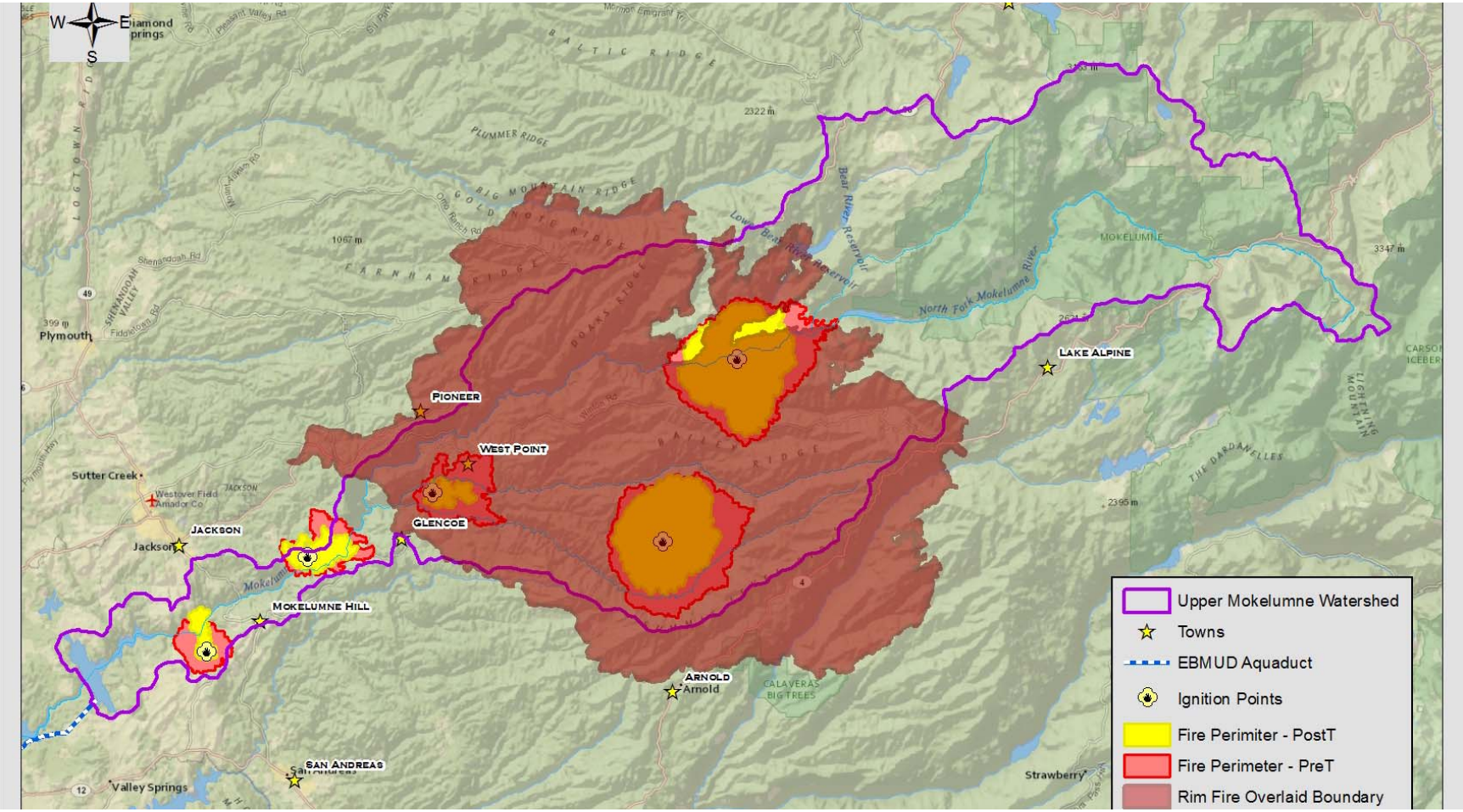
- Steps to establish a Forest to Faucet Model

SierraNevada.ca.gov/Mokelumne

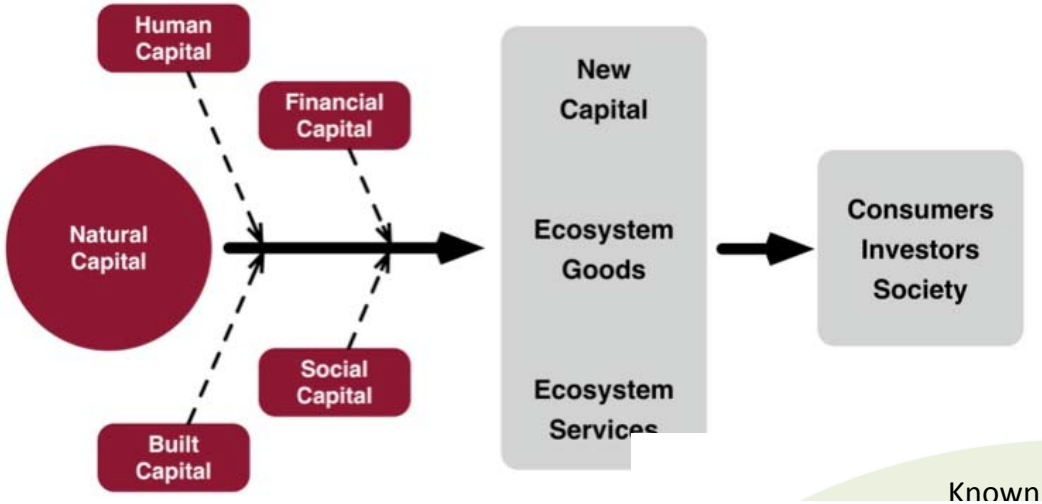
kim.carr@sierranevada.ca.gov

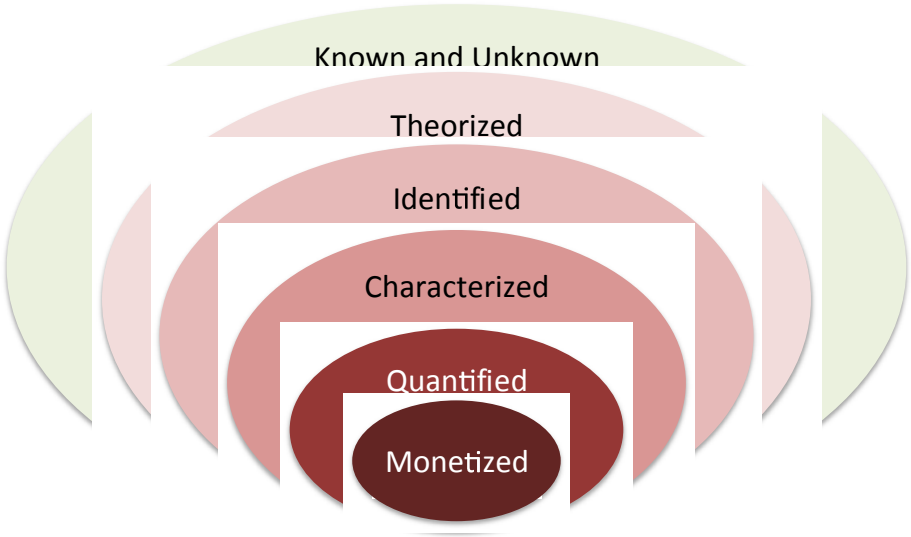
Mark Buckley
ECONorthwest

Should we invest in forests?



Valuation context





Ecosystem service demand

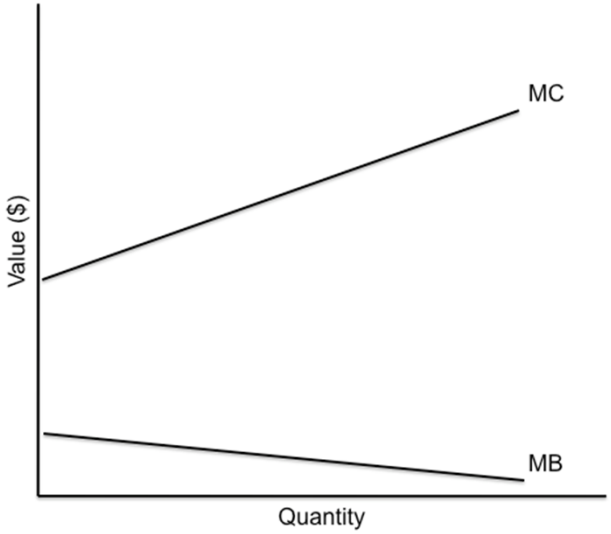
- Demand drivers:
  - the quality and supply of ecosystem processes, including regularity and extent
  - the value of activities utilizing the ecosystem services
  - the number of people using the ecosystem service
  - communities of concern using the ecosystem service
  - the cost and availability of substitutes and complements
  - changes over time – scarcity, resilience, preferences
  - the risk and uncertainty associated with outcomes

Markets work sometimes

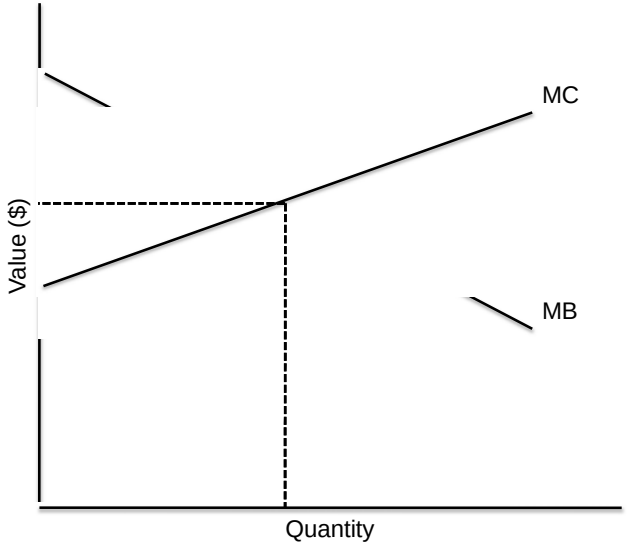
	Excludable	**Non-Excludable**
Rival (Limited)	**Private Goods** •Timber •Buildings **Markets Work**	**Common-Property Resources** •Water supply (aquifer, streamflow) •Fisheries **Oversight Required**
Non-Rival (Unlimited)	**Toll Goods** •Bridges •River Access	**Public Goods** •Water quality, scenery •Flood protection **Collective Provision**

Avoided costs

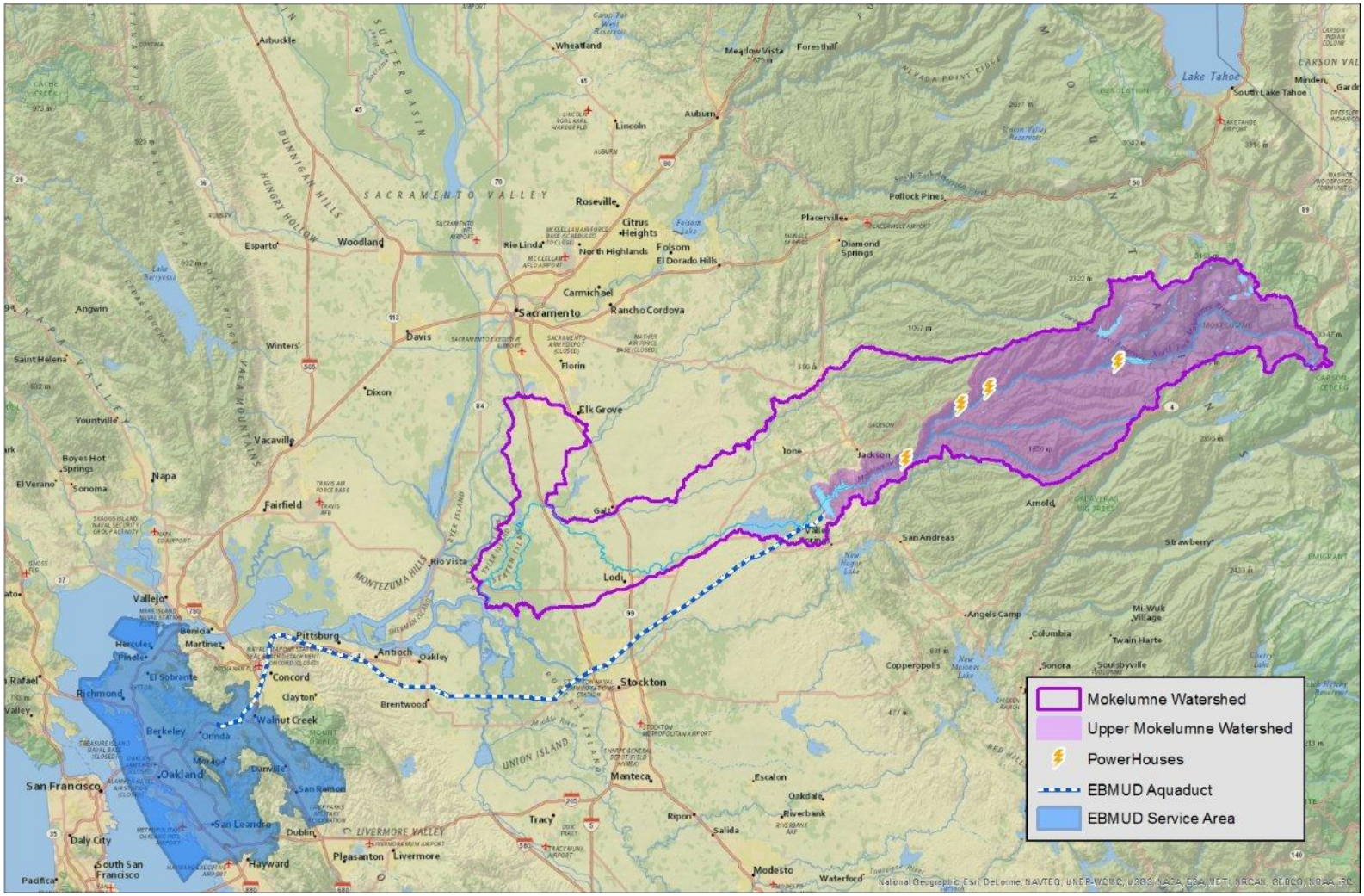
- Costs of services that would otherwise be required
- Depends on supply (marginal cost) AND demand (marginal benefit)
- Avoided cost requires demand drivers



•New information
•Change in tastes
•New regulatory requirements
•New regulatory framework
•Demographic/population shifts

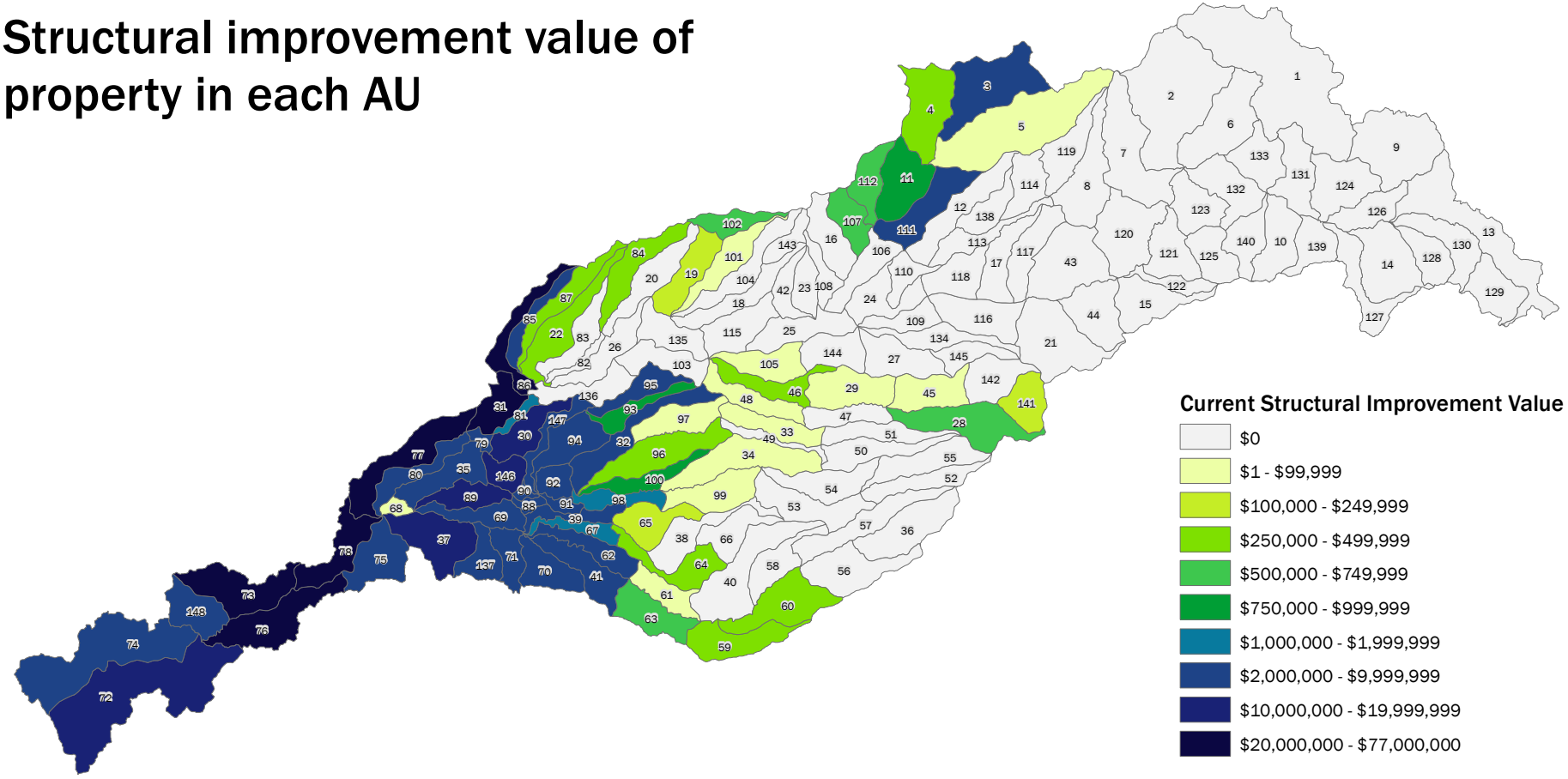


Mokelumne River Basin



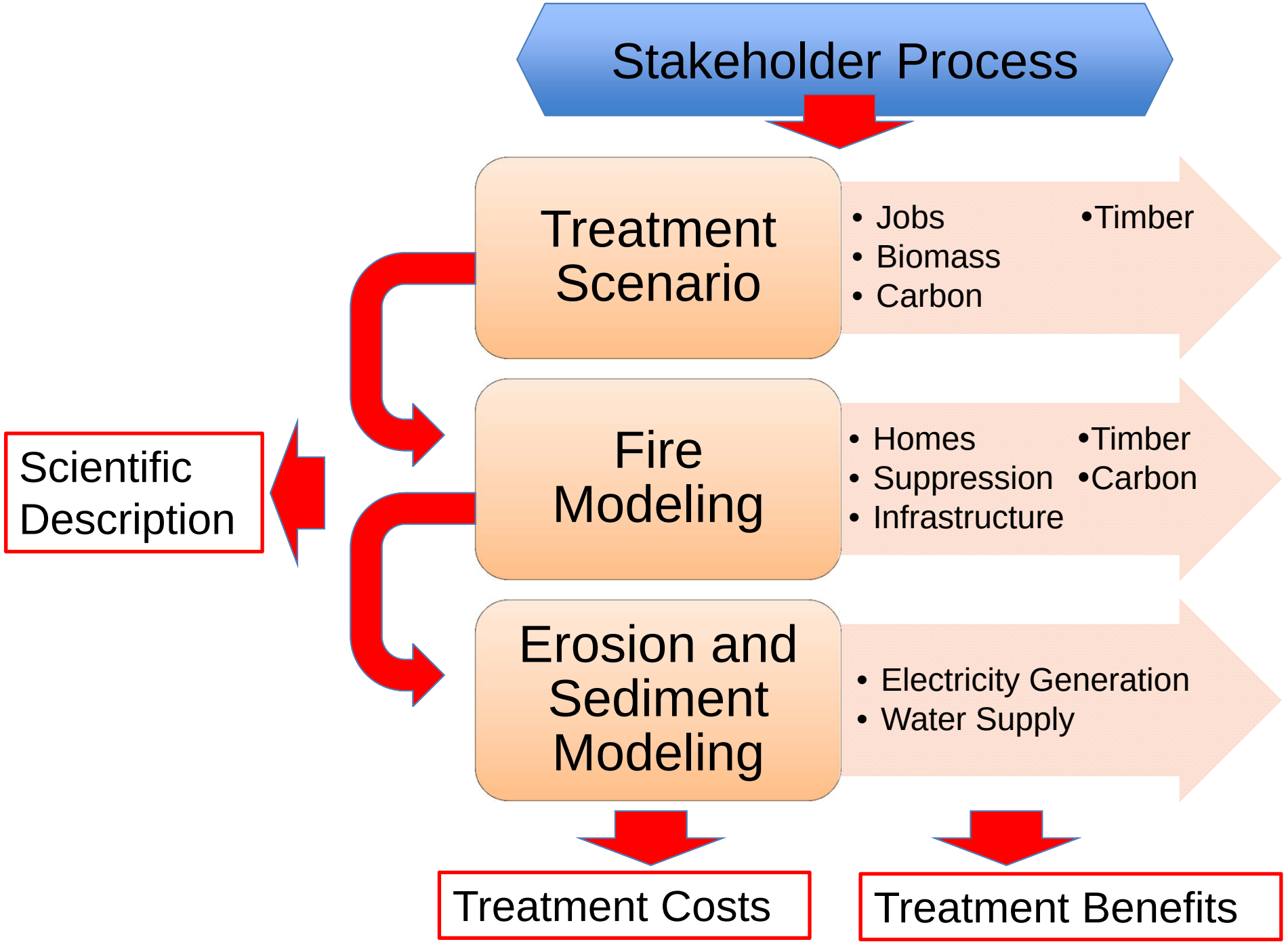
Mokelumne Watershed

Structural improvement value of property in each AU

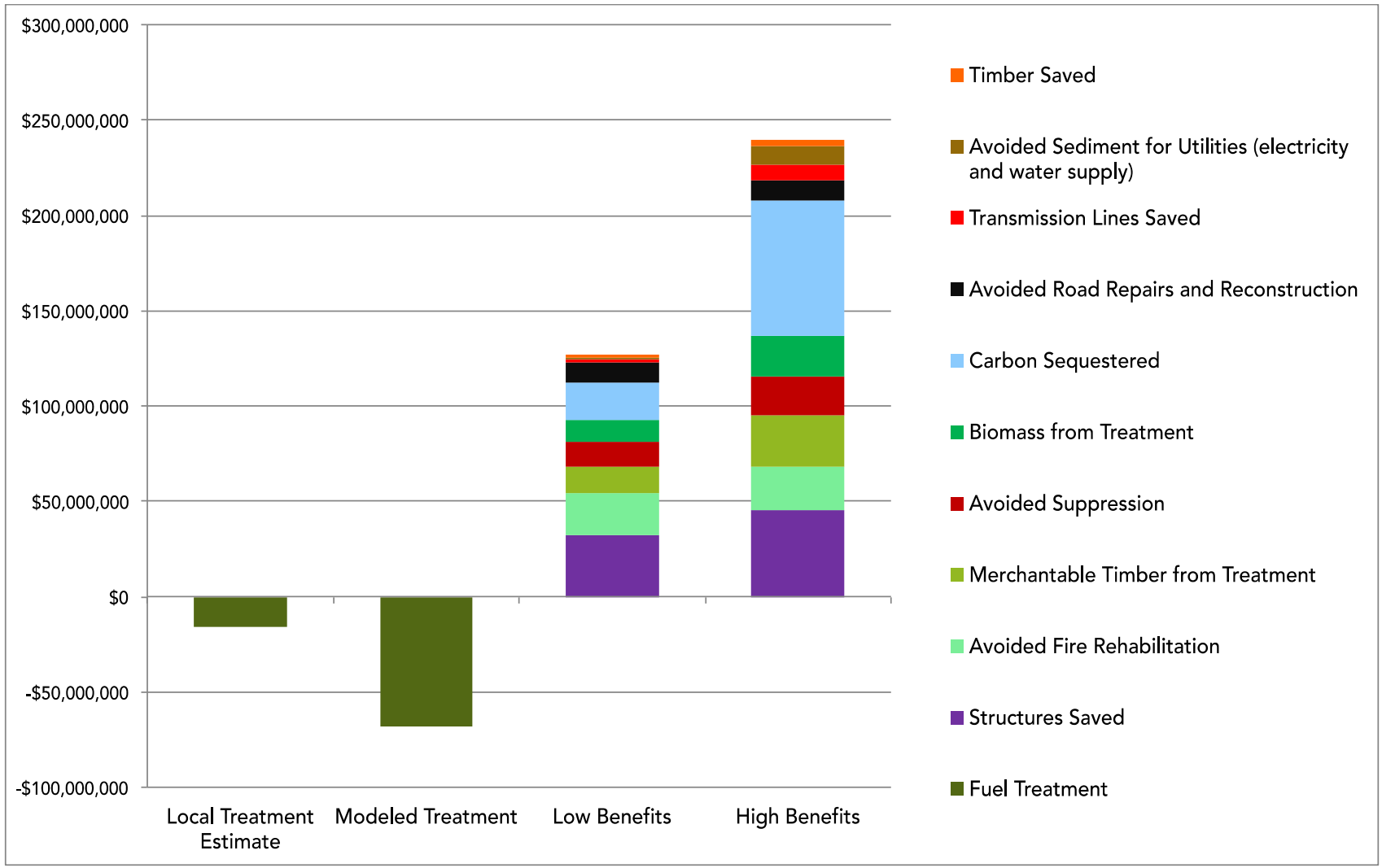


Data from Calaveras County Assessor and Amador County Assessor, 2012 tax rolls.

ECONorthwest

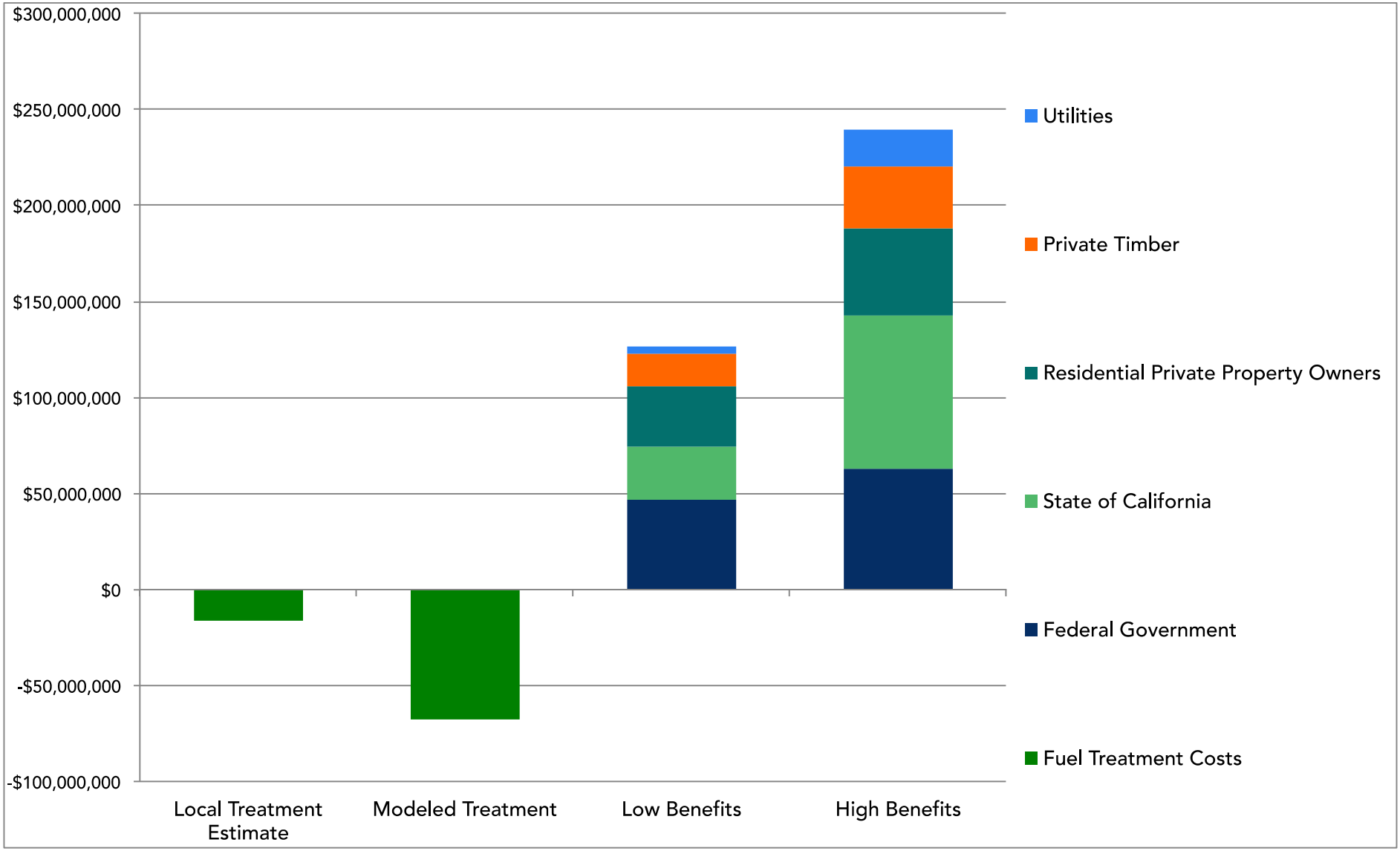

Stakeholder Process
Treatment Scenario
• Jobs
• Biomass
• Carbon
•Timber
Fire Modeling
• Homes
• Suppression
• Infrastructure
•Timber
•Carbon
Erosion and Sediment Modeling
• Electricity Generation
• Water Supply
Scientific Description
Treatment Costs
Treatment Benefits

Fuel treatment avoided costs



Does not include air quality, recreation, habitat, water quality

Distribution of avoided costs



Forest management implications

- Wildfire avoidance investments can be cost-effective
- Scarcities are shifting for goods and services provided by forests
- Current markets might not always best identify optimal uses of forest capital
- Fire, water, and quality of life intersect to drive important forest tradeoff decisions

Tim Ramirez
San Francisco Public Utilities Commission

Hetch Hetchy Regional Water System

Operated by the San Francisco Public Utilities Commission

The Economic Impact of the 2013 Rim Fire on Natural Lands

Making the Economic Case for Conservation

June 25, 2014

Tim Ramirez

Natural Resources and Lands Management

Water Enterprise

Hetch Hetchy Regional Water System

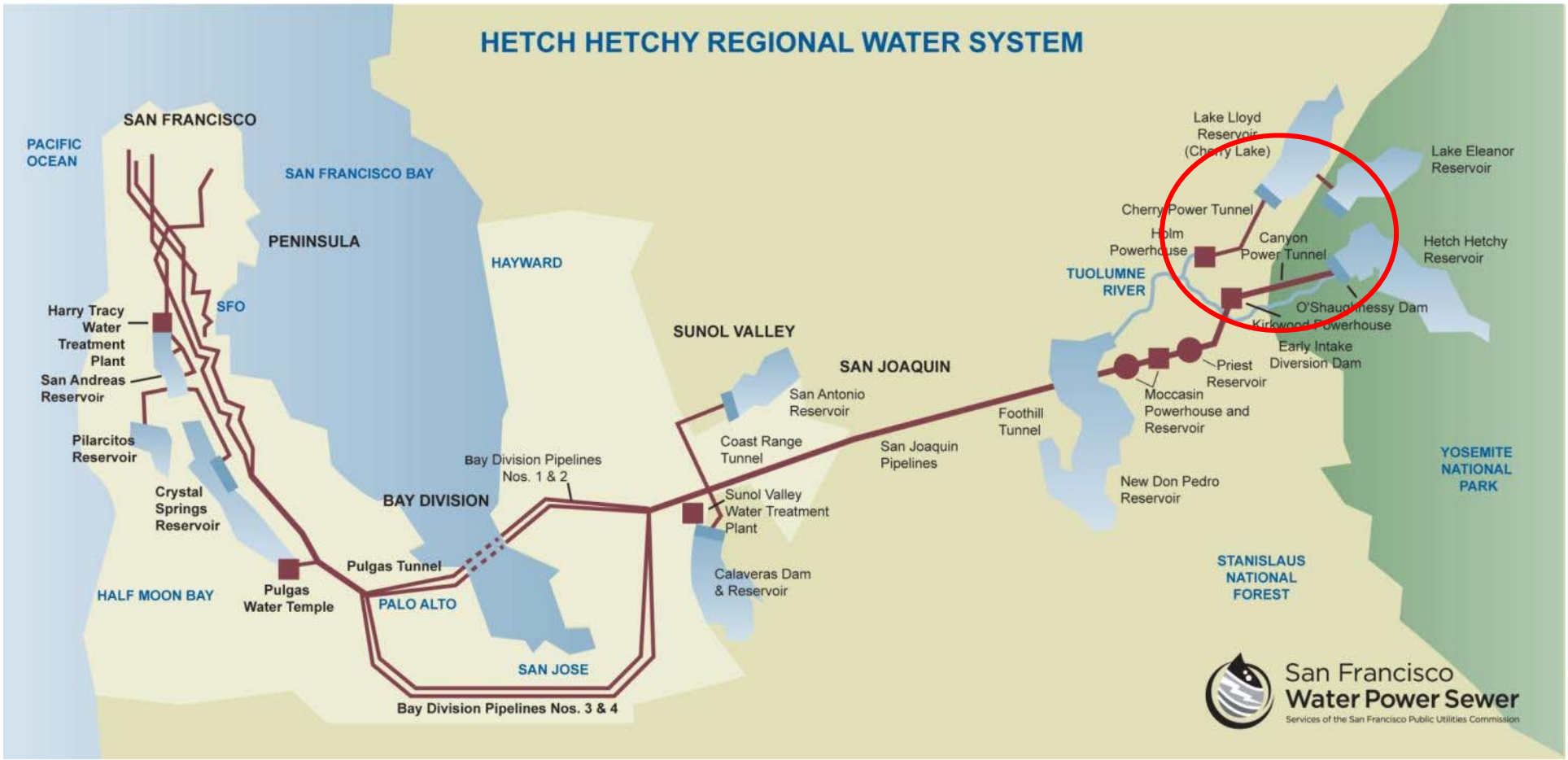
Groveland, CA
August 23, 2013

Hetch Hetchy Regional Water System

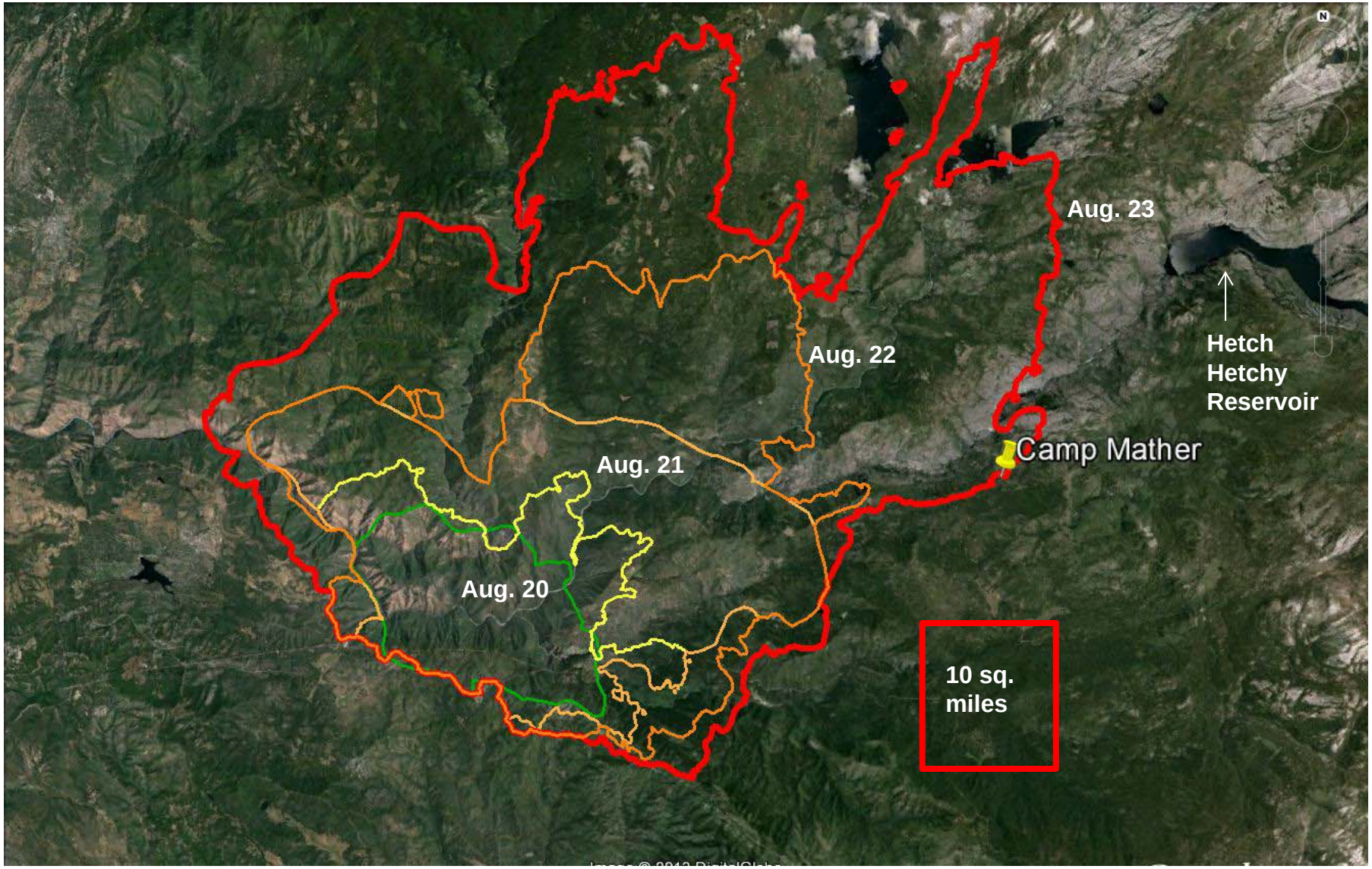
San Francisco Chronicle
August 28, 2013

Hetch Hetchy Regional Water System

Water System Schematic

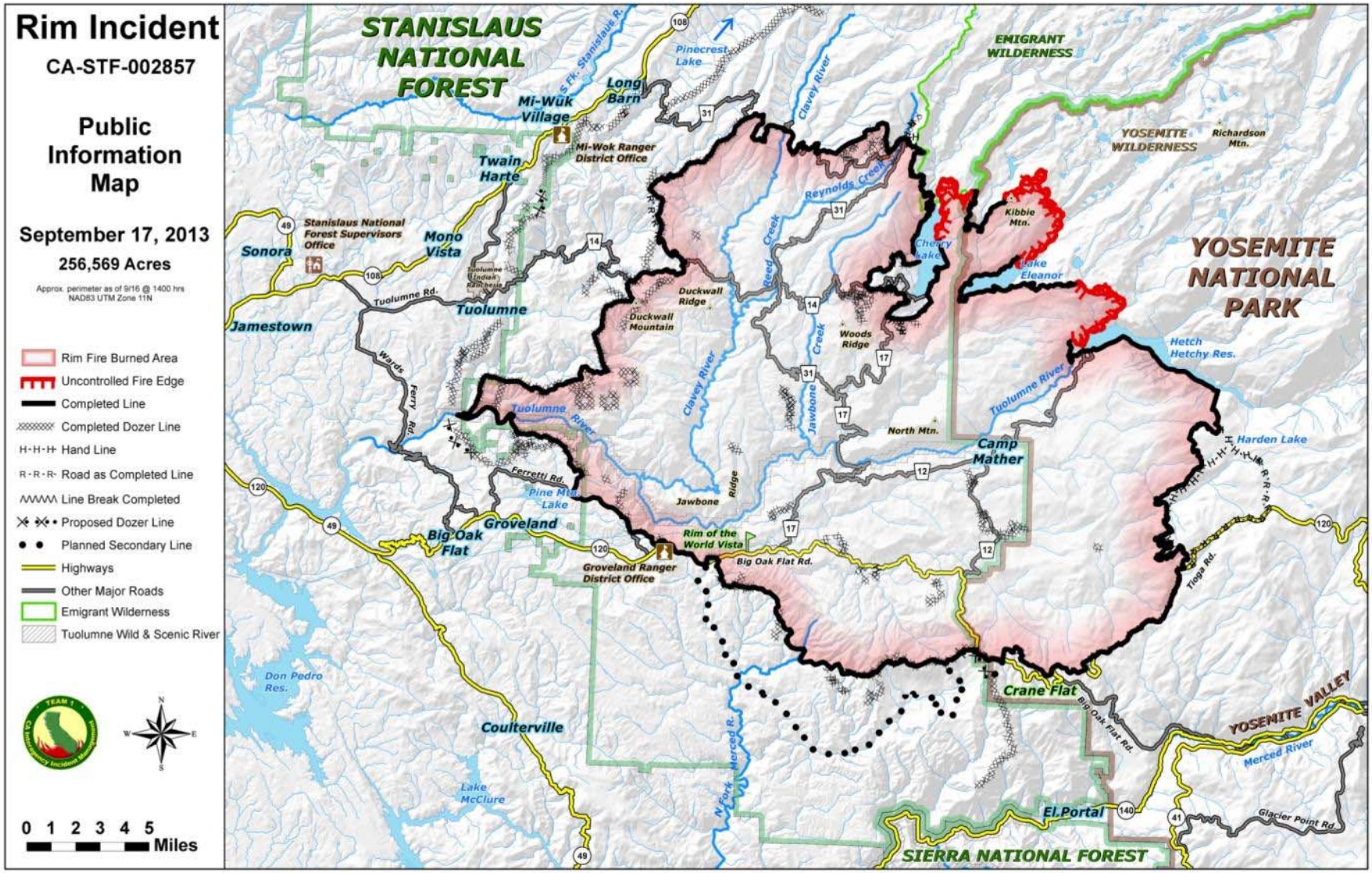


Daily Progression of Rim Fire



Hetch Hetchy Regional Water System

Rim Fire



Rim Fire Stats

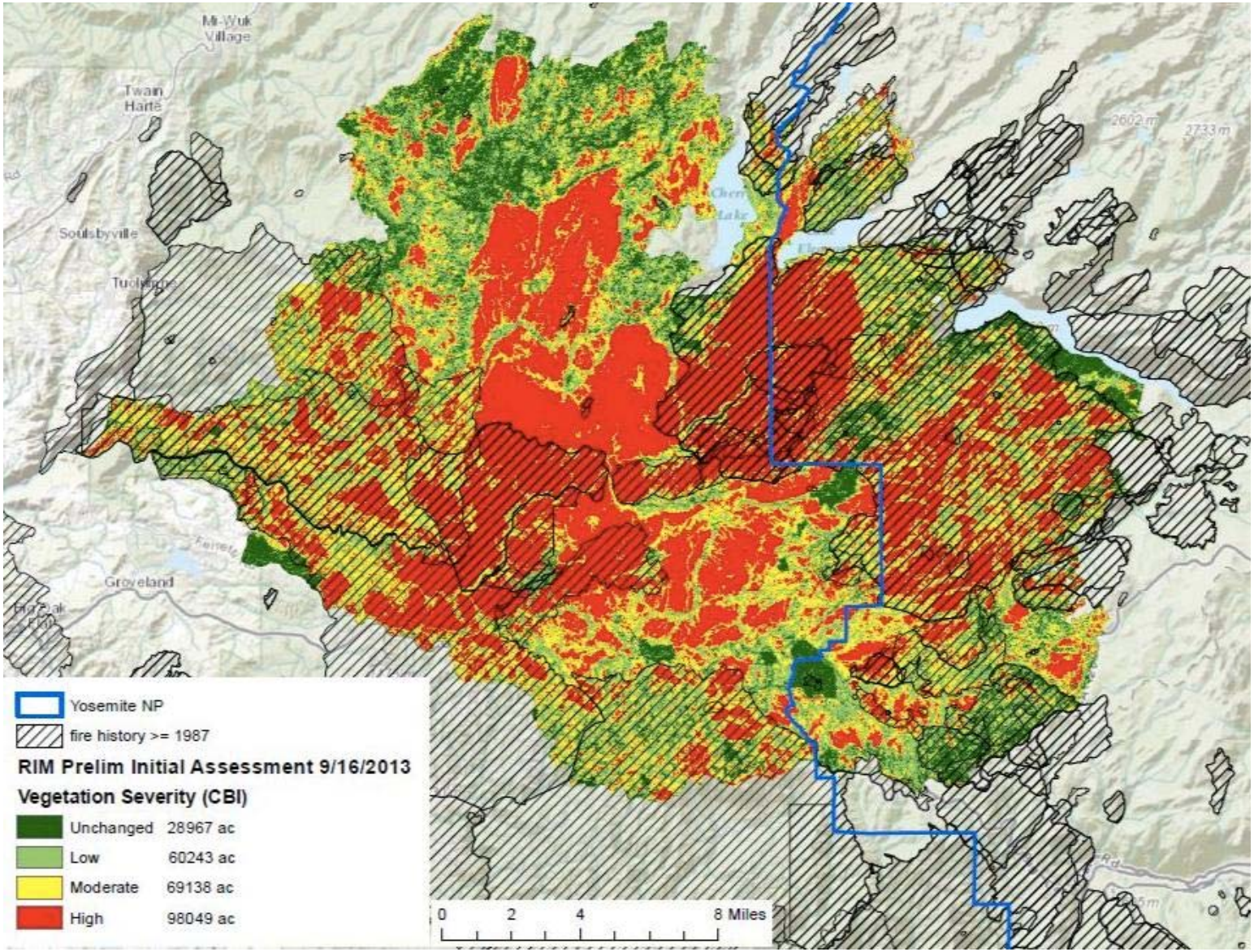
- Total of 257,314 acres
  - 3rd largest fire in CA history
- 100% contained as of 10/24/13
- Firefighting Costs: $127.350 million

Assessment and Recovery

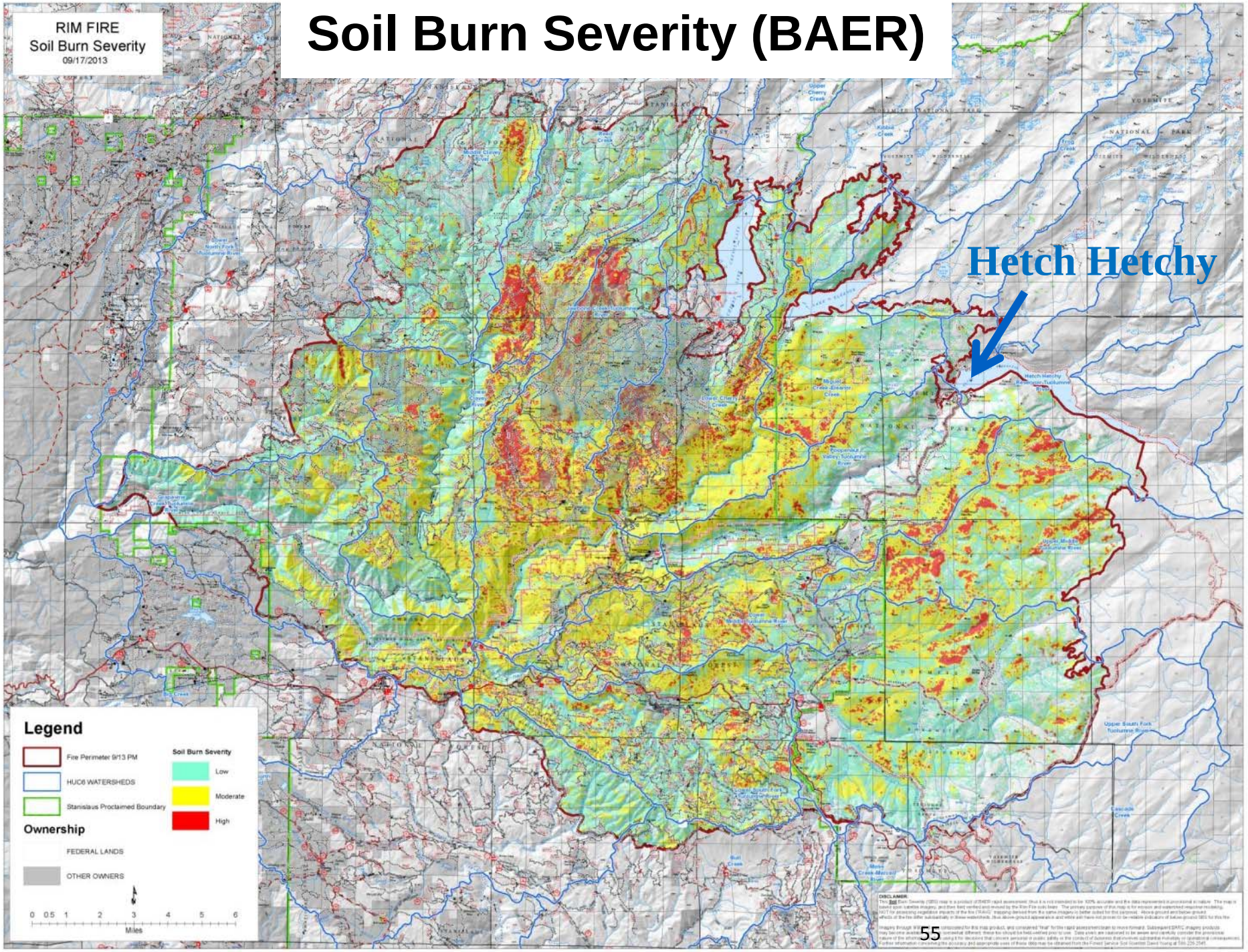
- Burn Area Emergency Response (BAER)
  - http://www.fs.usda.gov/detail/stanislaus/home/?cid=stelprdb5435147
- Hetch Hetchy Watershed Effects Report (January 14, 2014 Commission meeting, Rim Fire Water Quality Report)
  - http://www.sfwater.org/modules/showdocument.aspx?documentid=4773
- Earth Economics
  - The Economic Impact of the 2013 Rim Fire on Natural Lands
  - http://www.eartheconomics.org/Page12.aspx

Hetch Hetchy Regional Water System

Vegetation Burn Severity (BAER)



Soil Burn Severity (BAER)

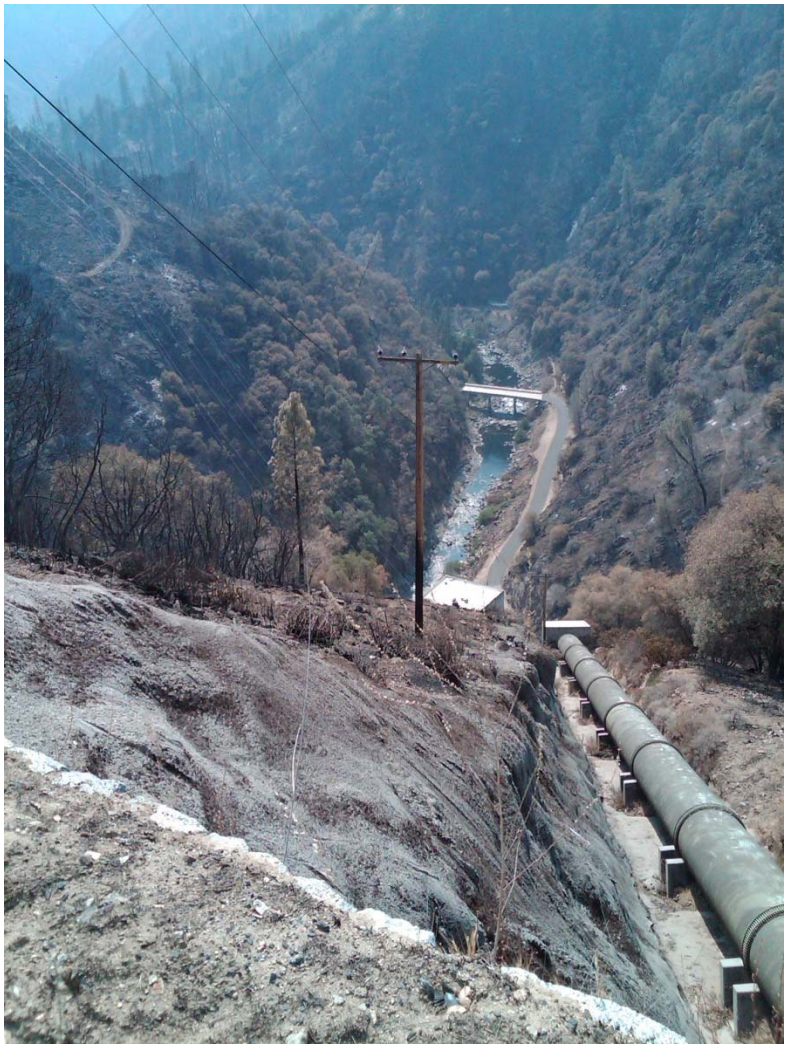


Low: *surface material is not completely burned, structural stability of soil is unchanged*

Moderate: *ground cover is consumed, ash may be blackened with patches of gray*

High: *all of the ground cover is consumed, bare soil and ash, loss of soil structure*

Cherry Creek and Holm Powerhouse

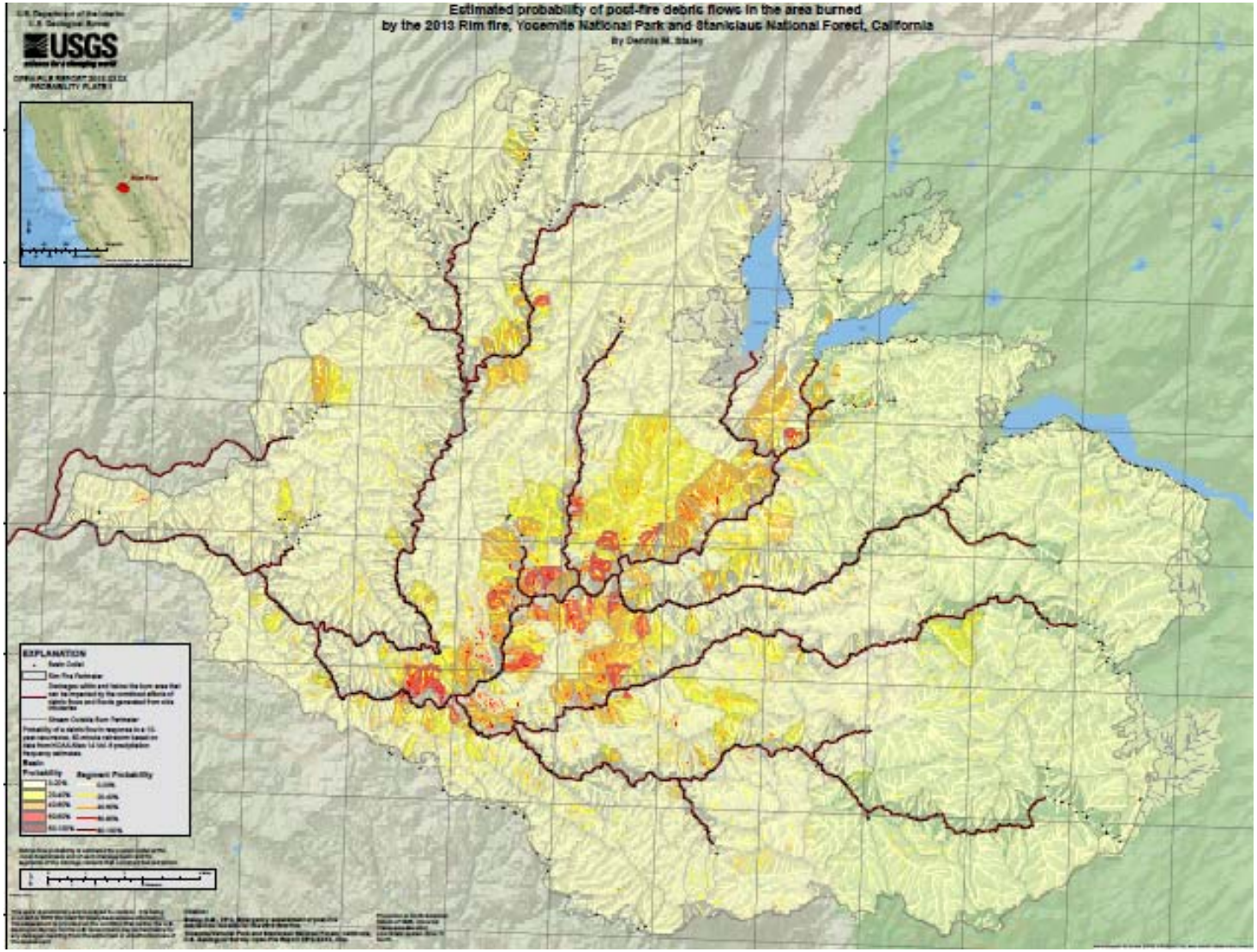


Hetch Hetchy Regional Water System

Granite Creek Watershed

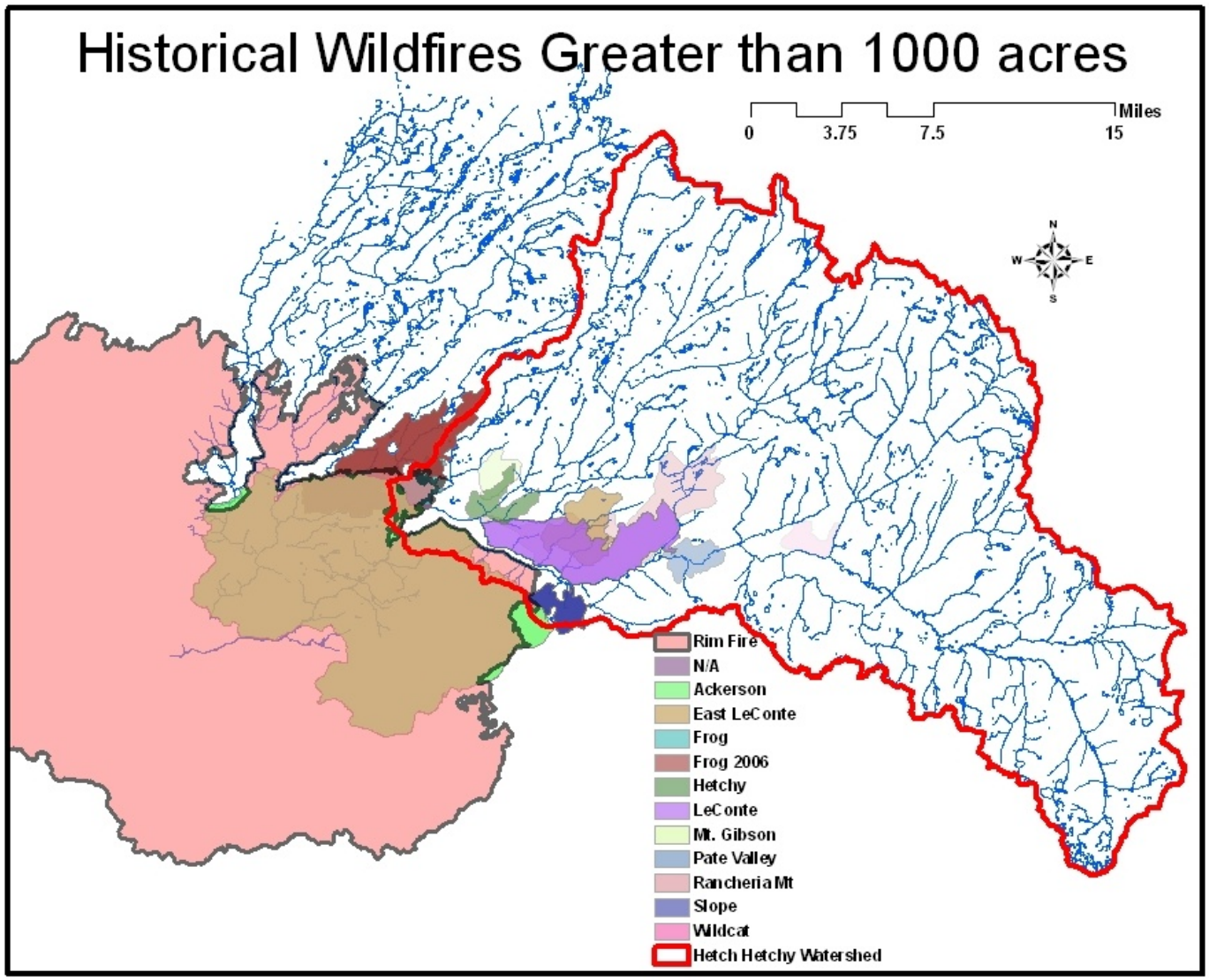
Hetch Hetchy Regional Water System

Rim Fire – Debris Flow Probabilities

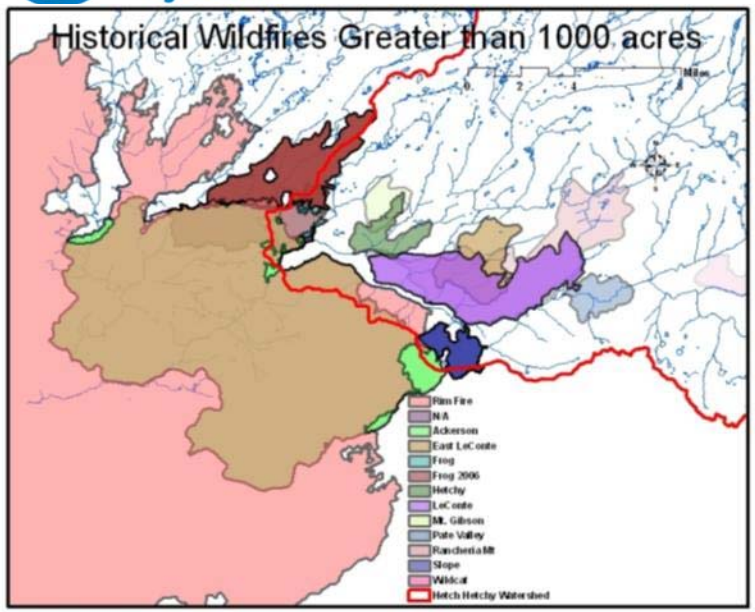


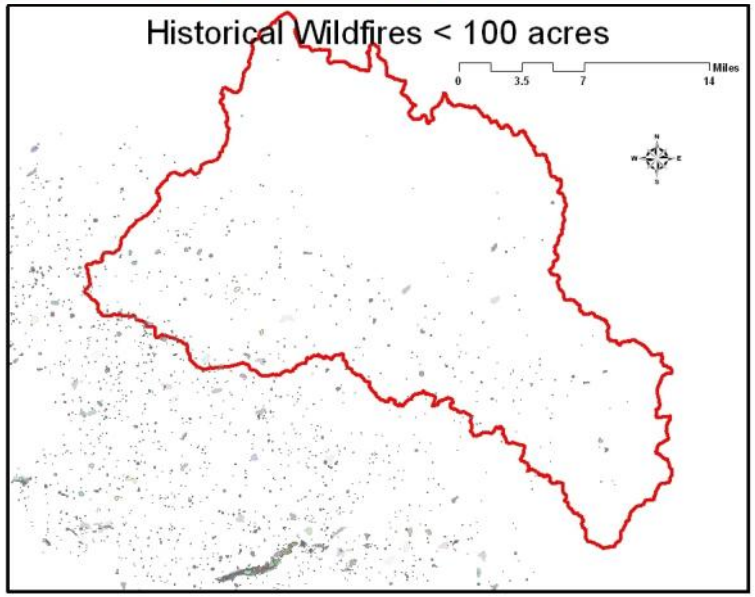
Hetch Hetchy Regional Water System

Fire History

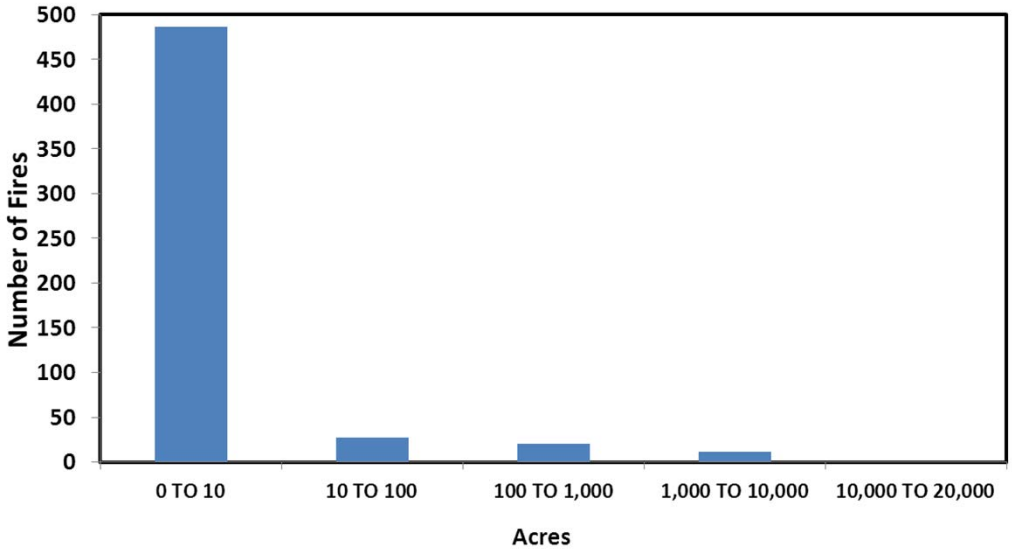


Recorded Fire History, since 1931



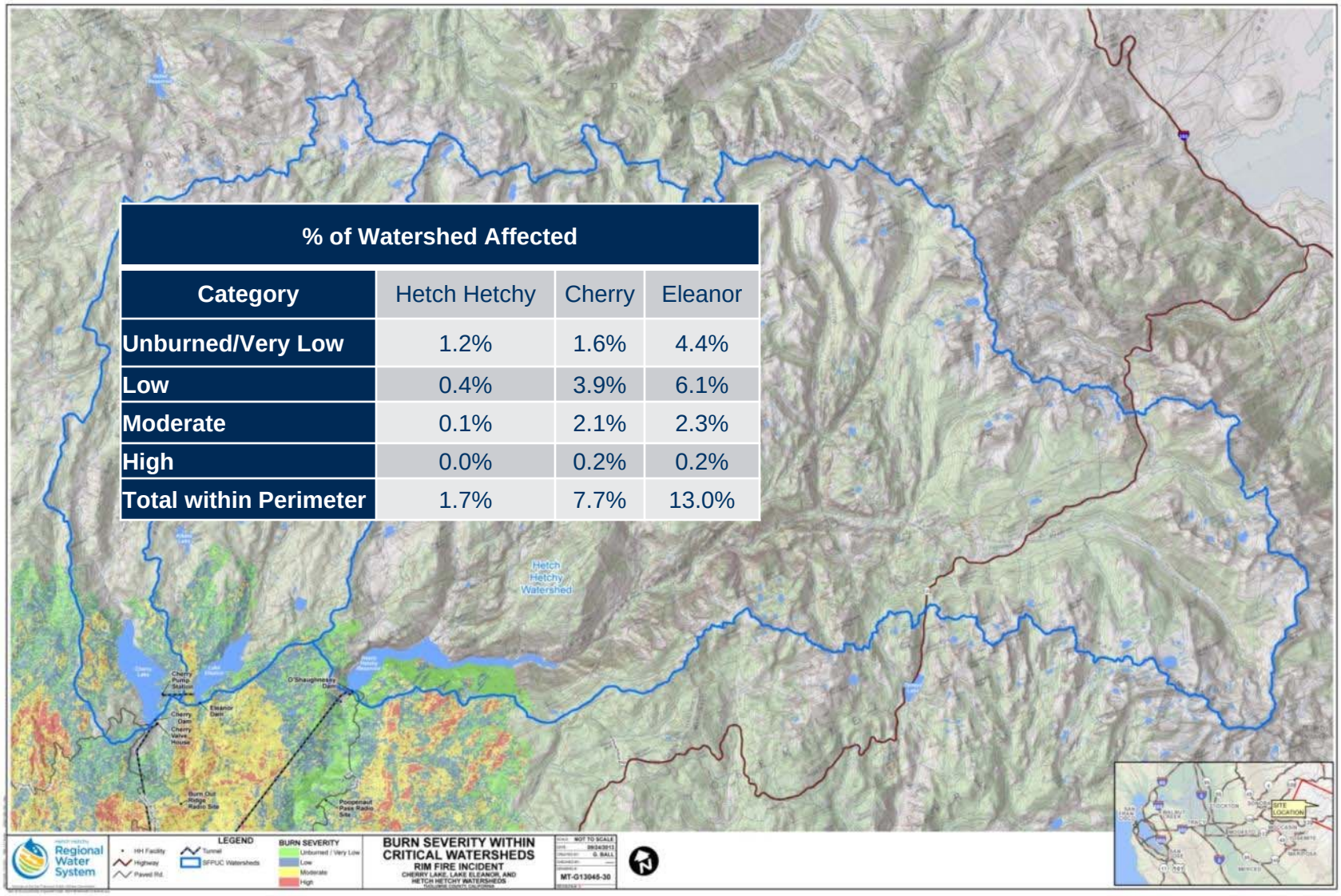


Year	Name	Acres
1948	Rancheria Mt	12116
1999	LeConte	8861
2013	**Rim Fire**	**5087**
1988	East LeConte	3755
1996	Ackerson	3634
2004	Hetchy	1937
1985	Pate Valley	1762
1991	Frog	1582
1978	N/A	1553
2010	Slope	1530
1960	Mt. Gibson	1472
2009	Wildcat	1293
2006	Frog	1098



Fire within Watersheds

% of Watershed Affected			
Category	Hetch Hetchy	Cherry	Eleanor
Unburned/Very Low	1.2%	1.6%	4.4%
Low	0.4%	3.9%	6.1%
Moderate	0.1%	2.1%	2.3%
High	0.0%	0.2%	0.2%
Total within Perimeter	1.7%	7.7%	13.0%



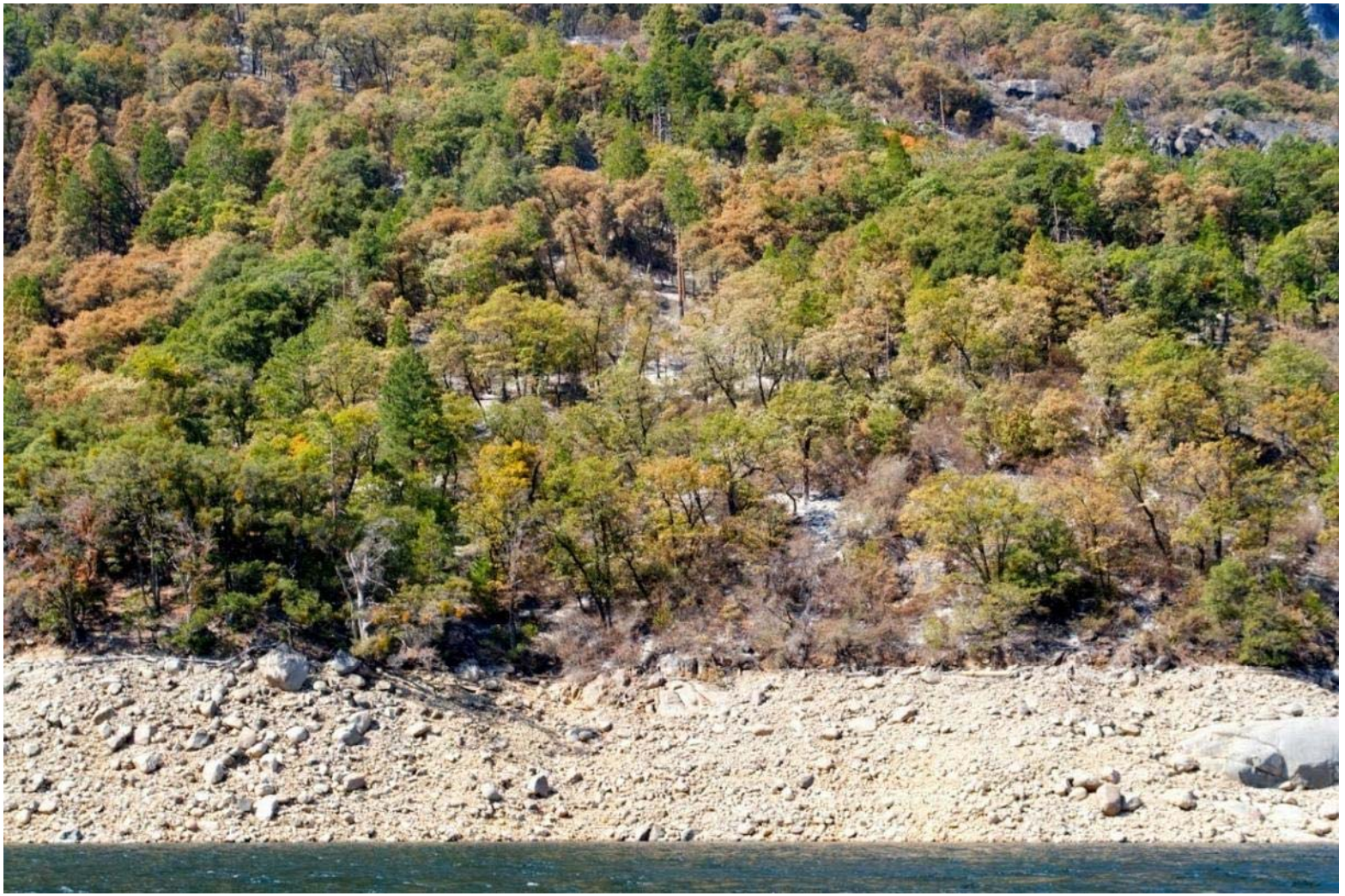
Hetch Hetchy Watershed

- Granite dominated basin
- Few sediment sources
- Generally low forest densities
- Discontinuous forest stands
- Nutrient limited
- Limited fuels near reservoir
- Active fire history

Understory Burn on South Shore – 9/17

Hetch Hetchy Regional Water System

Understory Burn on South Shore – 9/17



Hetch Hetchy Regional Water System

San Francisco Chronicle
November 15, 2013

Tom Meyer / www.meyertoons.com

Emergency Response Key Dates

- **October 23** – Gov. Brown issues Executive Order directing state-level recovery assistance

- **November 4** – Presidential disaster declaration and request for federal assistance denied (did not meet $51 million threshold, after accounting for Fire Management Assistance Grants)

- **December 13** – Presidential disaster declaration (total damages estimated at $54 million, covers August 17 through October 24)

- **NOTE** – we contracted with Earth Economics during the fire to prepare the "Preliminary Assessment: The Economic Impact of the 2013 Rim Fire on Natural Lands" report, which was included in the Governor's appeal letter dated December 2nd

Economic Impact of the Rim Fire on Natural Lands

- Earth Economics under contract to the SFPUC
- Four types of economic value
  - Provisioning: food, water, medicine, energy, etc.
  - Regulating: air quality, climate stability, pollination, biological control etc.
  - Supporting: habitat & biodiversity, genetic resources
  - Edifying: aesthetic; cultural & artistic; recreation & tourism; science & education; spiritual & historical
- Losses range from $250M to $1.8B
  - Environmental benefit/ecosystem services loss estimated at $100 to $736 million
  - Carbon sequestration loss valued at $102 to $797 million
  - Private property loss at $49 to $265 million
- Report included in Governor's successful appeal for federal disaster declaration

10 of 15 Ecosystem Service Types Valued Within Rim Fire Burn Area

	Food Provisioning	Raw Materials	Medicinal Resources	Air Quality	Climate Stability (Carbon Sequestration)	Moderation of Extreme Events	Soil Retention	Biological Control	Water Regulation	Soil Formation	Pollination	Habitat and Biodiversity	Aesthetic Information	Recreation and Tourism	Science & Education
Grassland				$	$						$		$		
Lake														$	
River												$	$	$	
Forest (Broad Leaf and other)				$	$			$	$				$	$	
Forest (Coniferous)				$	$	$		$	$		$			$	
Shrub				$	$						$			$	
Herbaceous Wetlands					$	$					$	$		$	
Riparian						$	$					$	$	$	

Key

Ecosystem service not produced by land cover

Ecosystem service produced by land cover, no dollar value established

Ecosystem service produced by land cover and dollar value(s) provided $

Hetch Hetchy Regional Water System

Environmental Benefit Losses Range from $100M to $736M

Ecosystem Service	Low	High
Aesthetic Information	$28.3	$334.3
Biological Control	0.8	0.8
Moderation of Extreme Events	44.0	45.6
Air Purification	01.6	31.4
Habitat and Biodiversity	0.1	65.0
Pollination	10.1	32.8
Recreation and Tourism	0.5	211.2
Soil Retention	0.0	0.1
Waste Treatment	14.8	14.8
	$100.0	**$736.0**

Carbon Sequestration Losses Range from $102M to $797M

Land Cover Type	LOW	HIGH
Aspen-Birch	$13.8	$104.6
Chaparrals	3.6	33.4
Douglas Fir	1.2	8.8
Lodgepole Pine	2.1	15.7
Mixed Conifer	62.9	478.6
Montane Riparian Meadows	9.3	84.0
Ponderosa Pine	8.7	66.1
Western Oak	0.9	6.5
	$102.4	**$797.6**

Economic Impact on Natural Lands Summary

- Pacific Northwest Watershed Managers, Watershed Economics Workgroup, and Earth Economics established the foundation which supports the EE Preliminary Assessment
- These efforts are consistent with changes being made at the national level (e.g., CEQ, FEMA) in response to natural disasters (e.g., Katrina, Sandy)
- More to be done to demonstrate how these responses apply to reducing the risk of catastrophic fires
- Still working towards accounting for the economic value of ecosystem services
  - GASB Advisory Council (Reno) – March 11, 2014

Questions and Answers

Ask questions through the chat pod

Foresters: Type your FULL NAME, email address and Licensing Number or SAF Membership/CF Number in the chat pod in order to receive CFE credit.

General Audience: If you would like a general certificate of attendance, please download the file in the "Files Pod."

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Or Contact

Susan Stein – sstein@fs.fed.us
Sara Comas - scomas@fs.fed.us