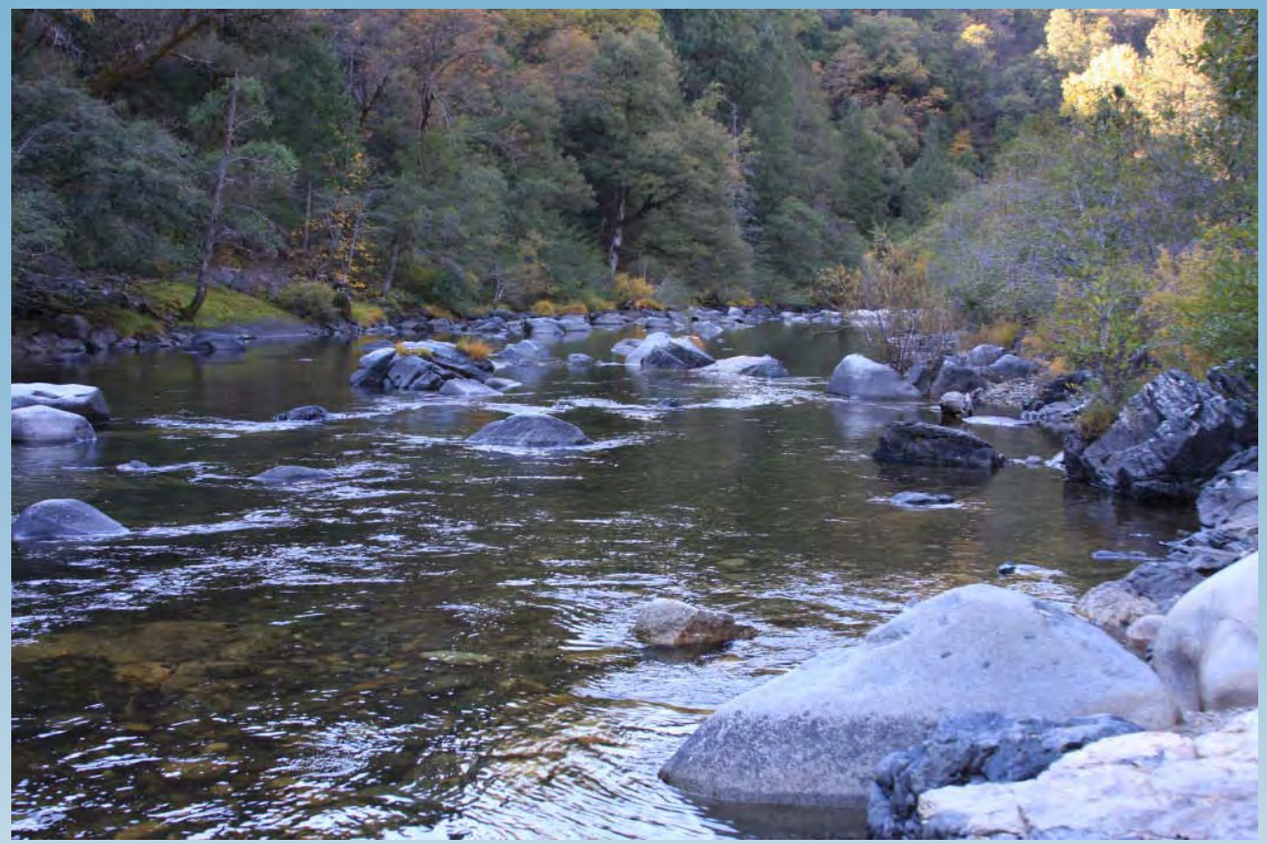


Mokelumne Avoided Cost Study

Mokelumne Watershed
Environmental Benefits Program

Sustainable Conservation

EDF
ENVIRONMENTAL DEFENSE FUND™
Finding the ways that work

SIERRA NEVADA CONSERVANCY

The Nature Conservancy
Protecting nature. Preserving life.™

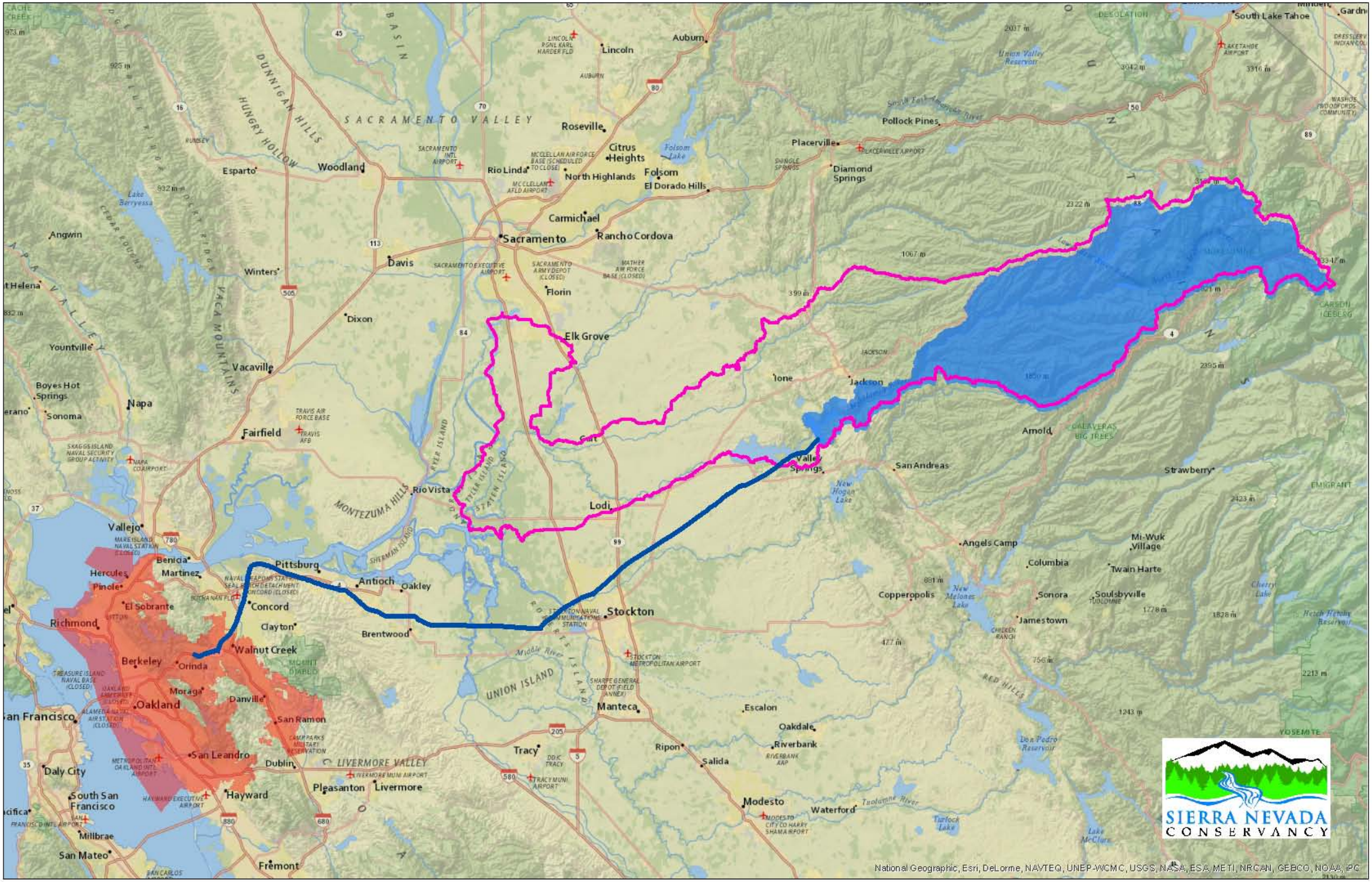
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

Environmental Incentives

www.SIERRANEVADA.ca.gov

PROPOSAL

Accelerate restoration and improve management across the watershed


Auburn
Lincoln
Roseville
Citrus Heights
Rio Linda
North Highlands
Folsom
El Dorado Hills
Placerville
Pollock Pines
South Lake Tahoe
Diamond Springs
Carmichael
Sacramento
Rancho Cordova
Woodland
Esparto
Winters
Davis
Dixon
Florin
Elk Grove
Angwin
Yountville
Vacaville
Napa
Sonoma
Boyes Hot Springs
Fairfield
Vallejo
Benicia
Martinez
Pittsburg
Antioch
Oakley
Concord
Clayton
Brentwood
Walnut Creek
Berkeley
Orinda
Moraga
Danville
Oakland
San Ramon
San Leandro
Dublin
Pleasanton
Livermore
Hayward
Daly City
South San Francisco
San Mateo
Millbrae
Fremont
Rio Vista
Lodi
Stockton
Manteca
Tracy
Ripon
Salida
Modesto
Waterford
Escalon
Oakdale
Riverbank
Ione
Jackson
Arnold
San Andreas
Valley Springs
Angels Camp
Copperopolis
Columbia
Sonora
Jamestown
Twain Harte
Mi-Wuk Village
Soulsbyville
Strawberry
SACRAMENTO VALLEY
SIERRA NEVADA
SIERRA NEVADA CONSERVANCY
National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC

Denver, Colorado

Over $145 million in costs since 1996 and 2002 fires

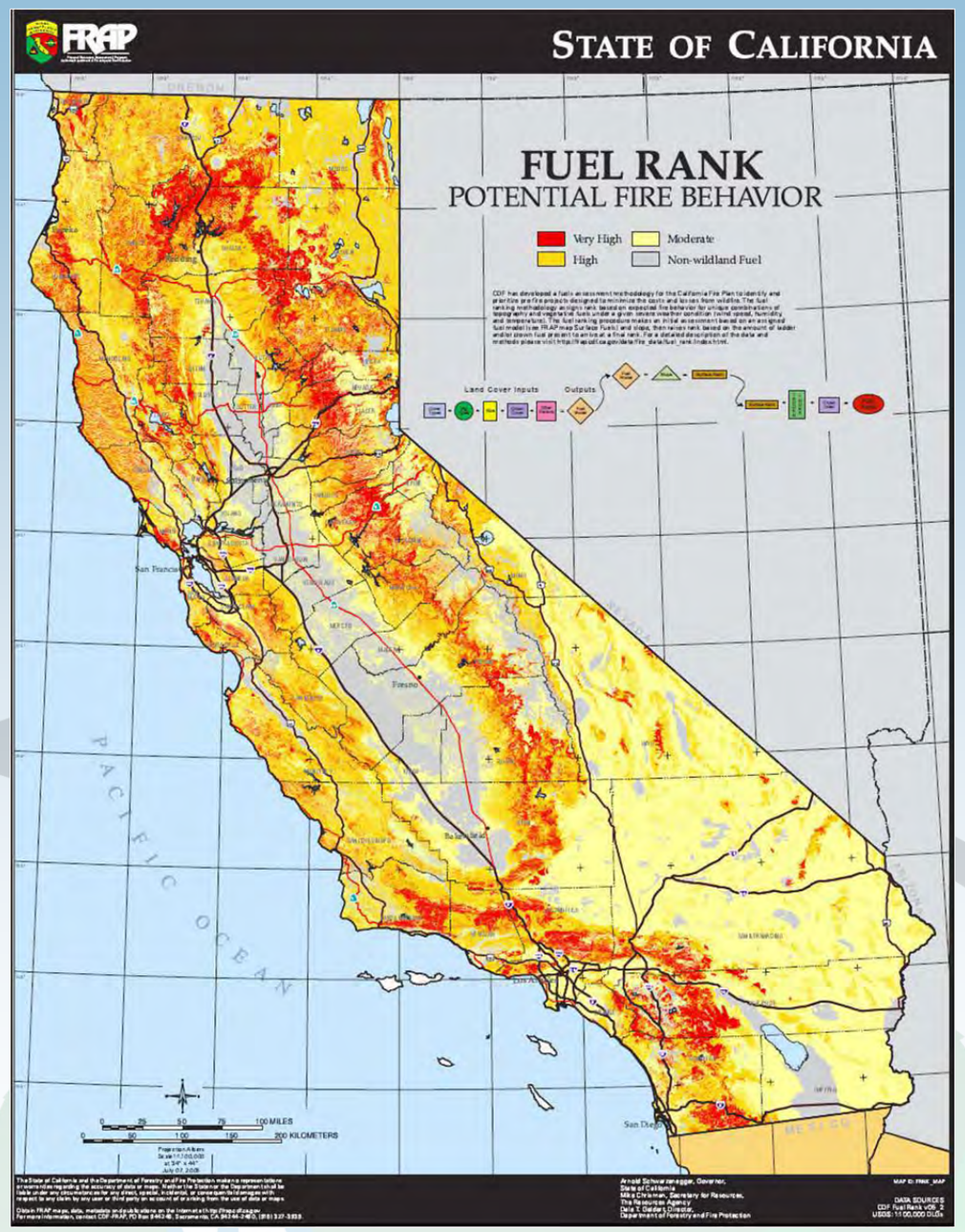
- $30 million dredge primary reservoir
- $42 million + fire suppression costs
- $37 million restoration costs
- $39 million destroyed structures

Denver Quote

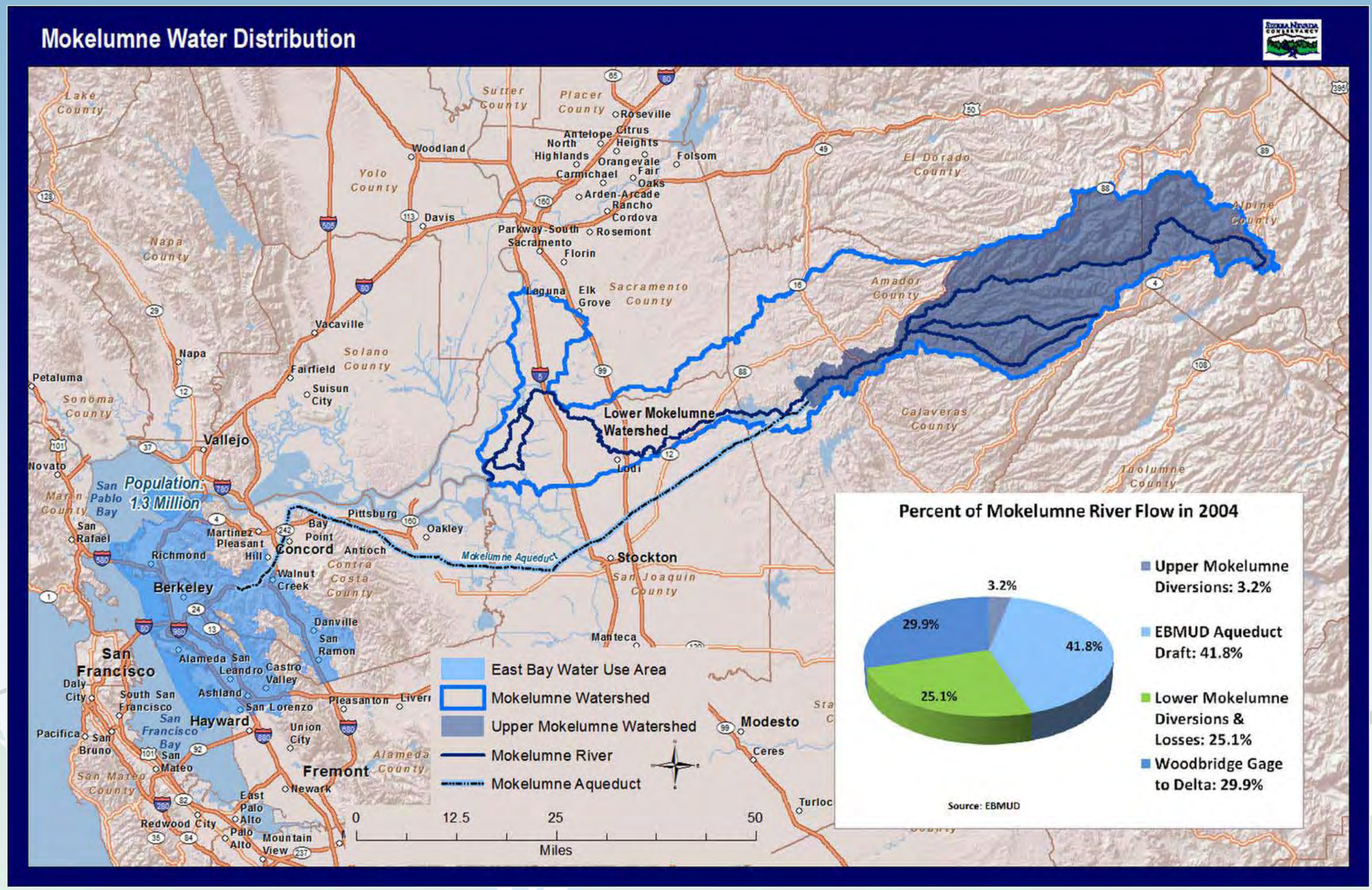
"We've realized the water does not come from the streams, it comes from the forest."

-Denver Water Board member

Fire: Current Conditions



Mokelumne Water Distribution



Primary Goals of the Project

- Calculate the avoided costs of increasing forest treatments in high fire risk areas and compare to current conditions
- Identify treatment scenario for most net benefits (benefits minus costs)to maximize net benefit of treatment
- Develop an investment platform to quantify and track environmental improvement within the watershed
- Encourage new investment in forest treatment to increase pace and scale
- Connect users of ecosystem services, such as water, to its source

Partners

Core Team:

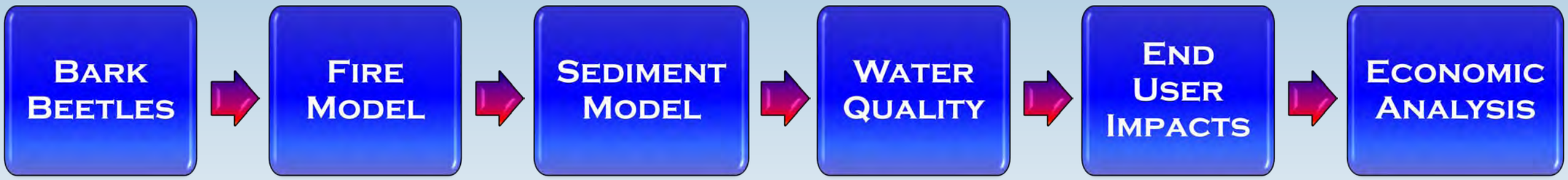
- US Forest Service Region 5
- The Nature Conservancy
- Sierra Nevada Conservancy

Advisory and Technical Teams:

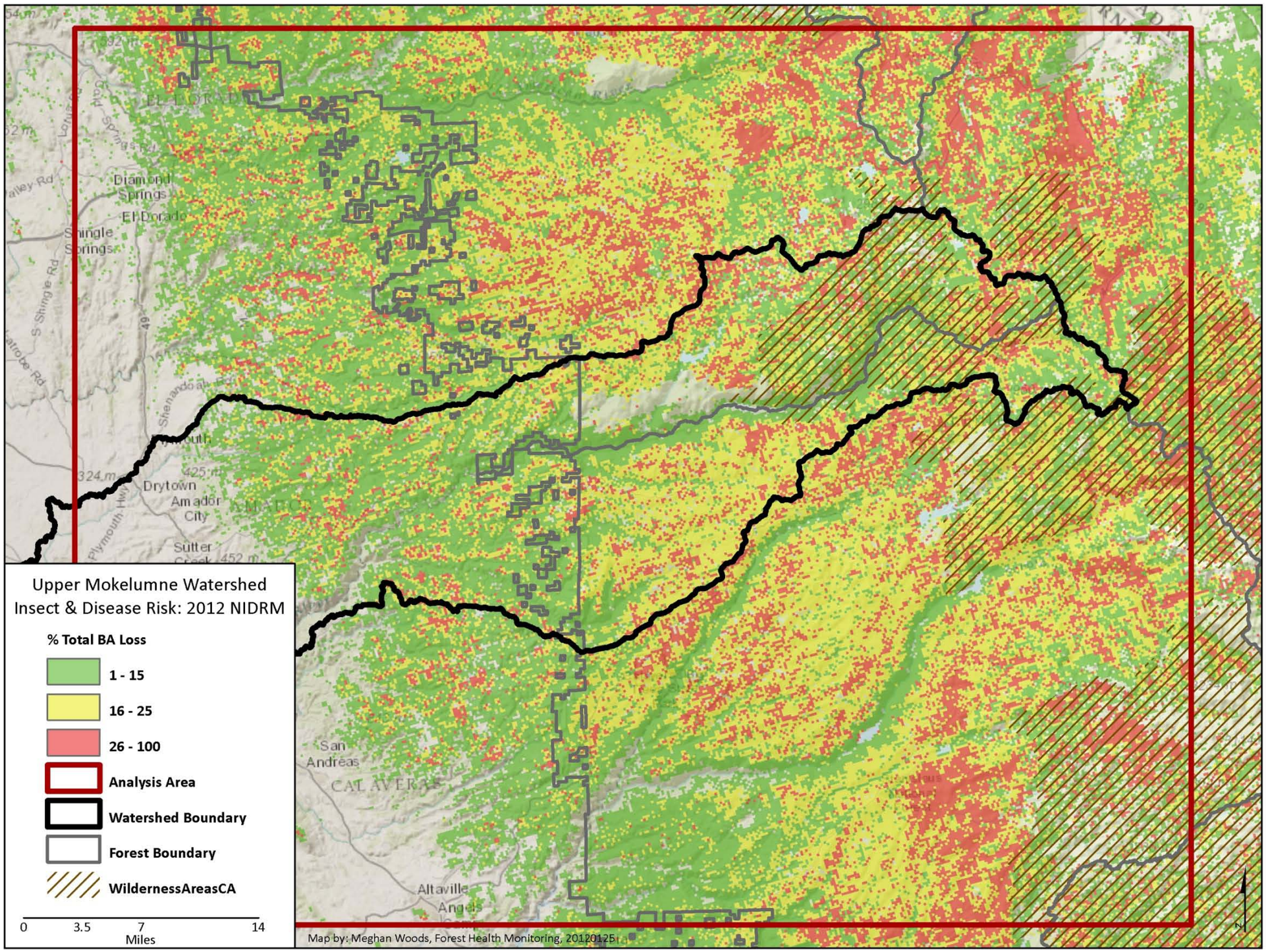
- East Bay Municipal Utility District
- Pacific Gas & Electric
- Eldorado National Forest
- Stanislaus National Forest
- Bureau of Land Management
- Sierra Pacific Industries
- Environmental Defense Fund
- Native American Community
- Foothill Conservancy
- Sustainable Conservation
- Department of Water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

Credit: Mathew Grimm/EDF

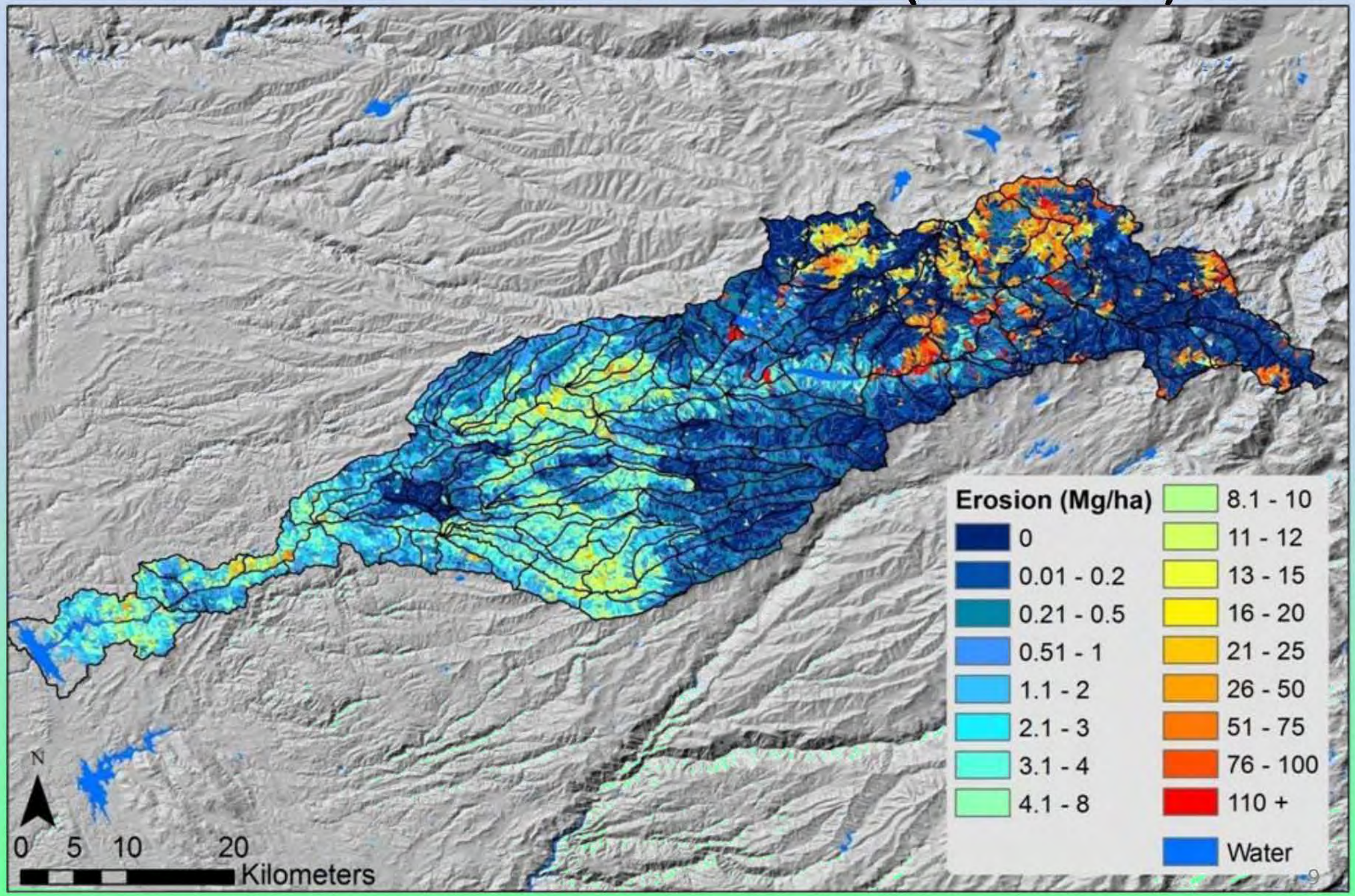
Model Flowchart



2012 Bark Beetle Forecast

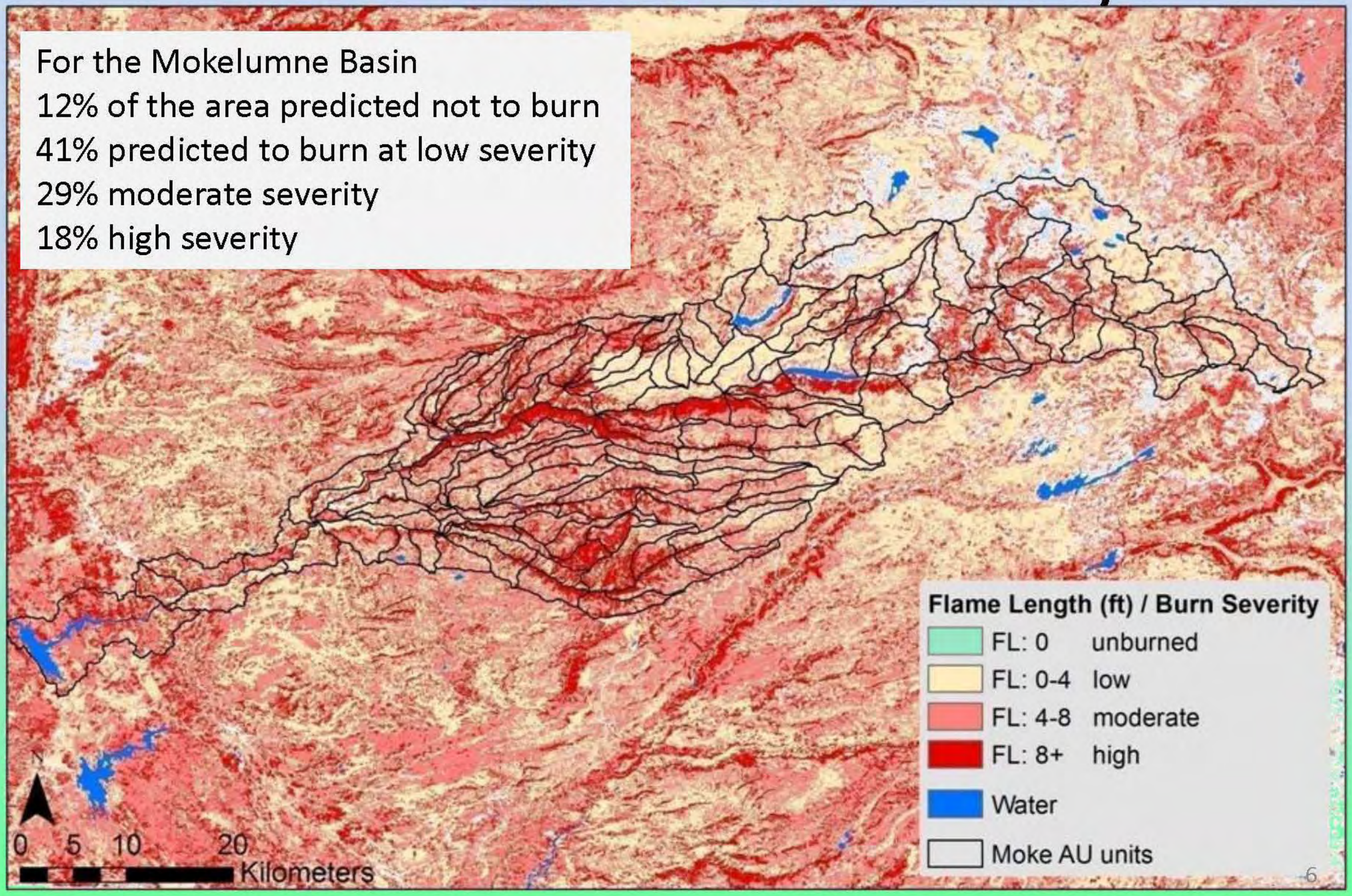


Results: Hillslope scale erosion predictions for current land cover (No Fire)

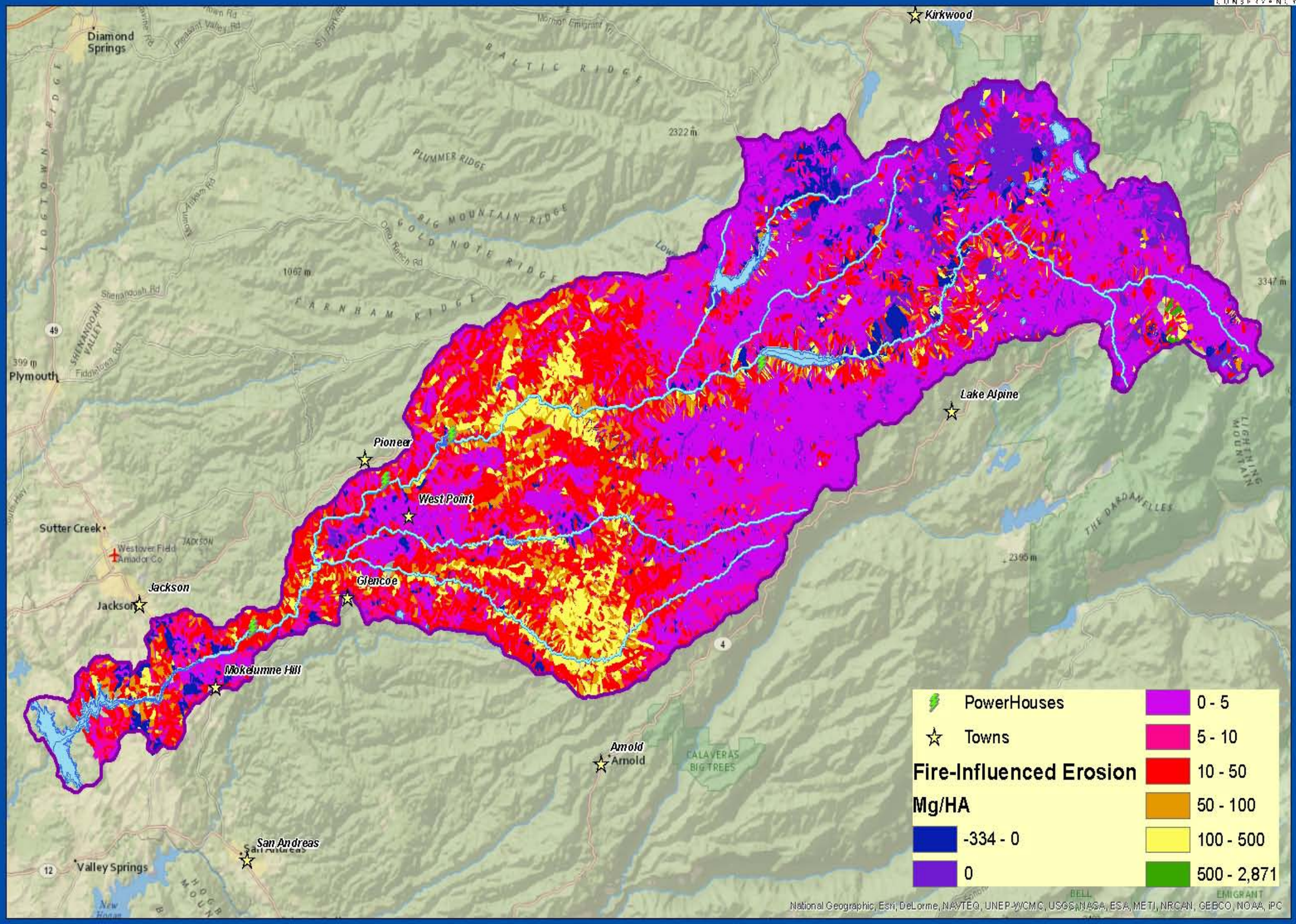


Inputs: Flame length predictions reclassified to burn severity

For the Mokelumne Basin
12% of the area predicted not to burn
41% predicted to burn at low severity
29% moderate severity
18% high severity

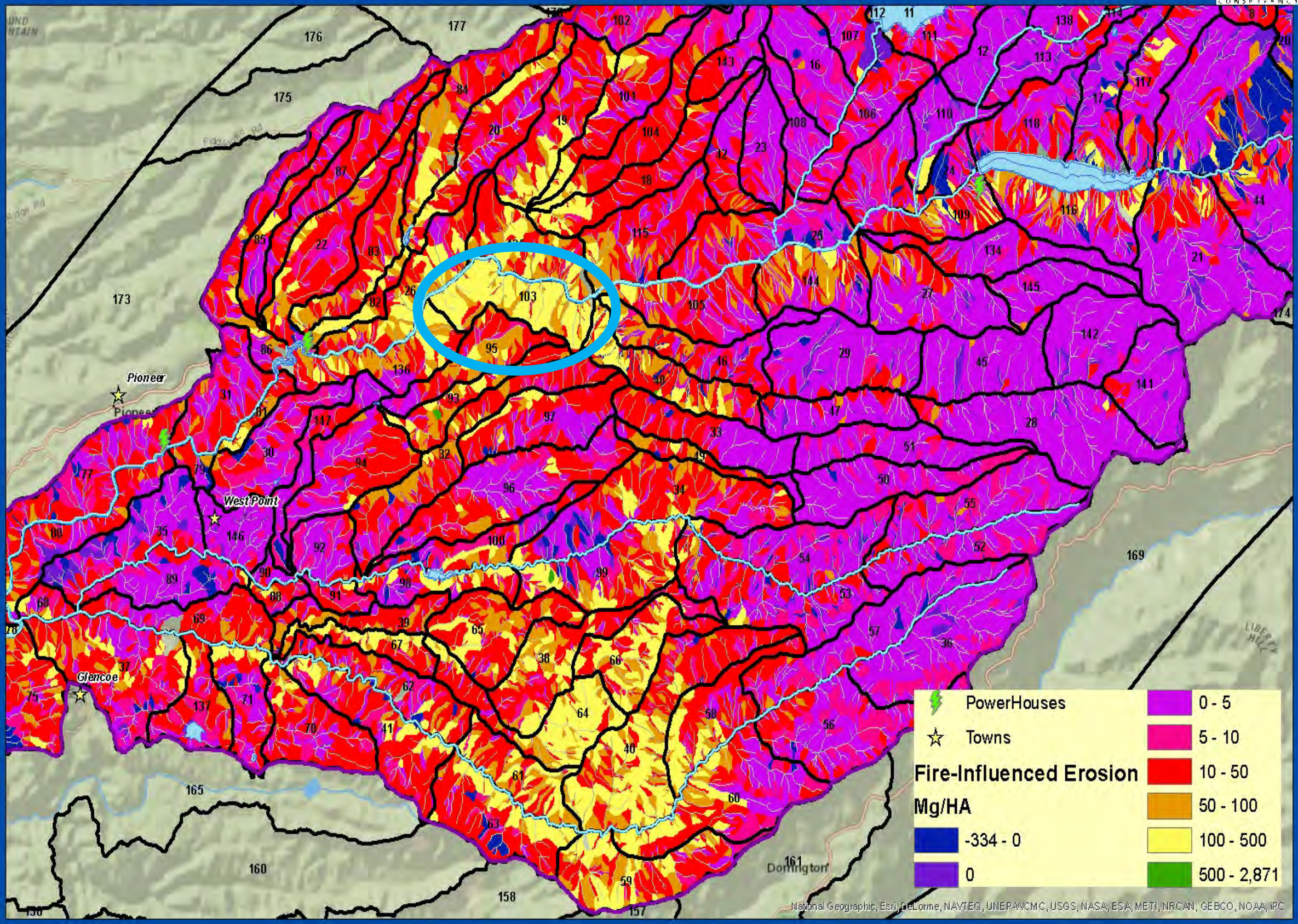


Hillslope Sediment (<2mm) Erosion As A Result of Fire



DRAFT

Hillslope Sediment (<2mm) Erosion As A Result of Fire



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How Much Is That?

- Unit # 103 on the previous map is approximately 2,000 acres in size.
- Average estimated erosion from that unit is 200 megagrams per hectare.
- If that unit was struck by fire and then eroded, how many dump trucks would that eroded sediment fill?

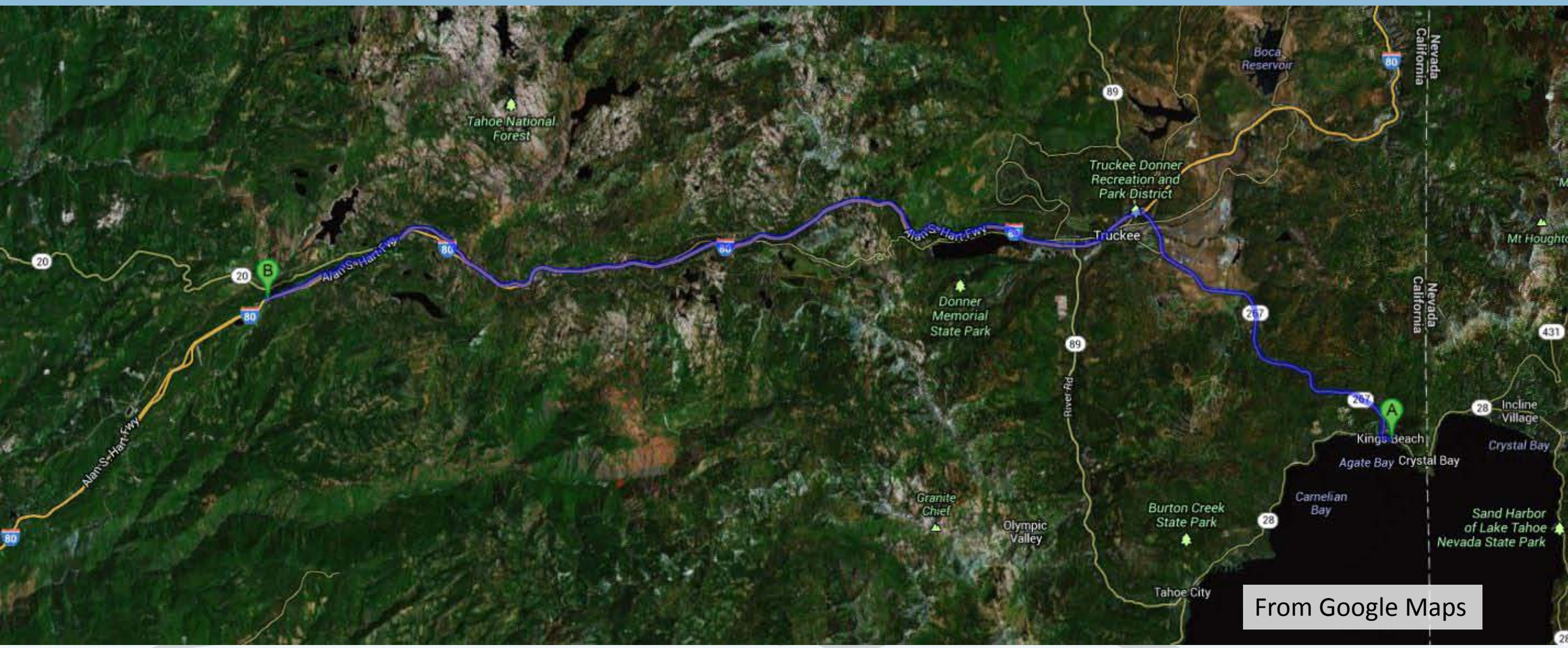
How Much Is That?

Each one of these can carry 50,000 lbs

Have a length of 32.5 feet

If all of the eroded sediment from that unit filled these trucks to their max capacity and they were set end to end, how far would it stretch?

How Much Is That?

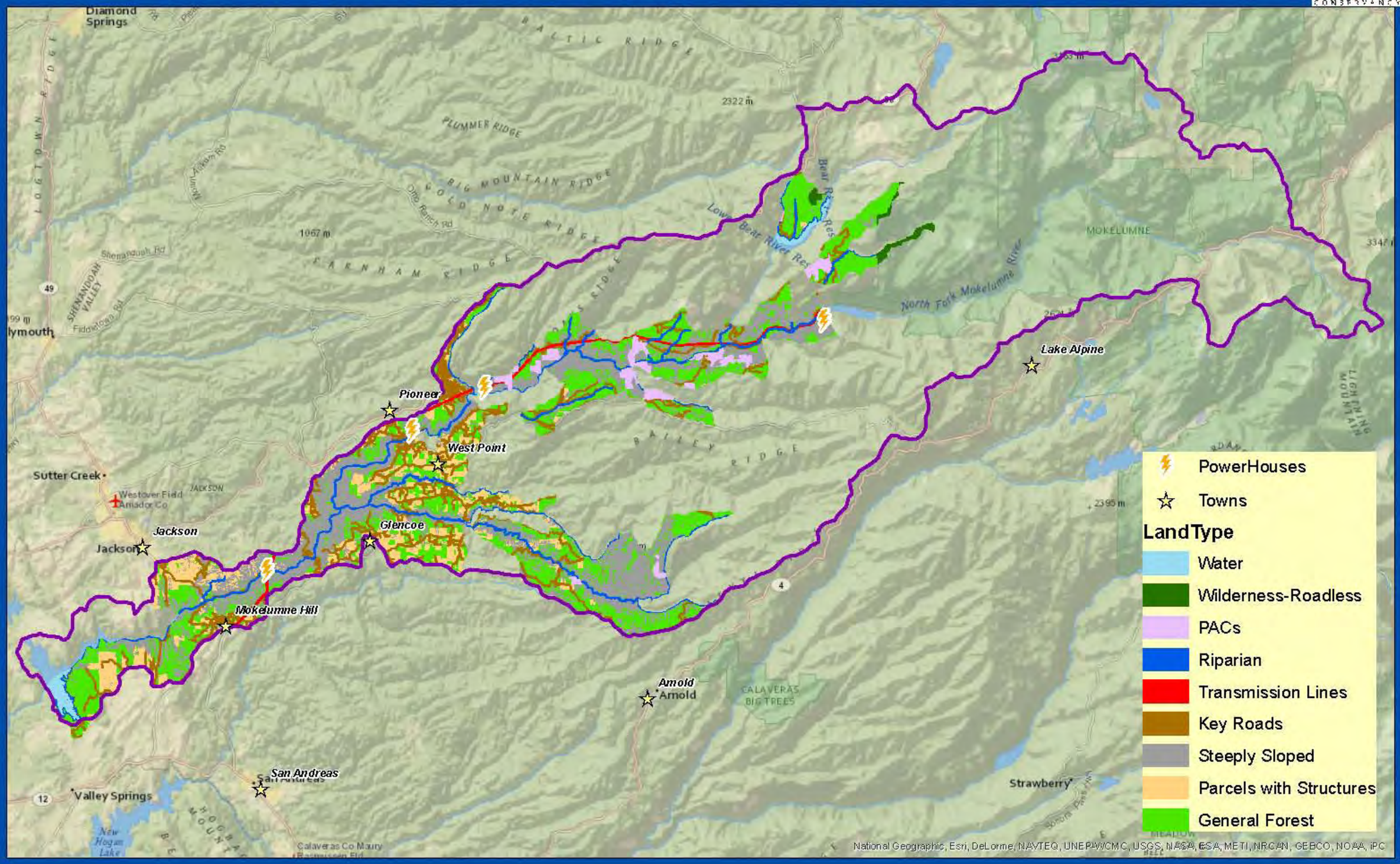


If parked end-to-end, it would fill enough dump trucks to stretch from the conference center to the Emigrant Gap exit on I-80, just over 40 miles.

Treatment Area Selection Process

- Stakeholder driven – both location and type/intensity of treatment;
- High-level perspective – 100,000-acres covered, overlooks many implementation obstacles;
- Designed to highlight areas where treatments are most effective to guide future work; and,
- Future work will focus on smaller areas with more realistic boundaries and treatments.

Mokelumne Watershed Treatment Areas by Land Type



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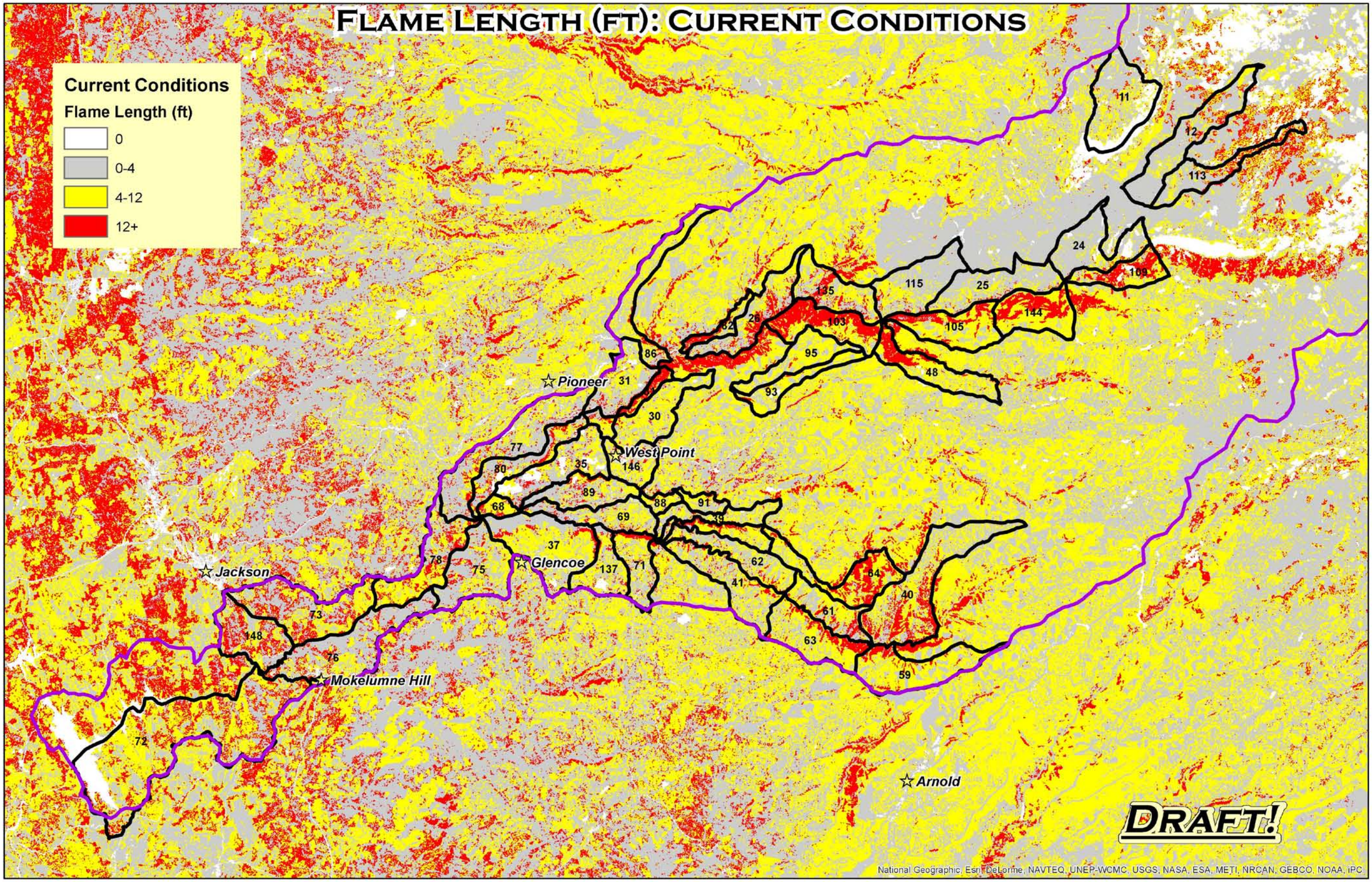
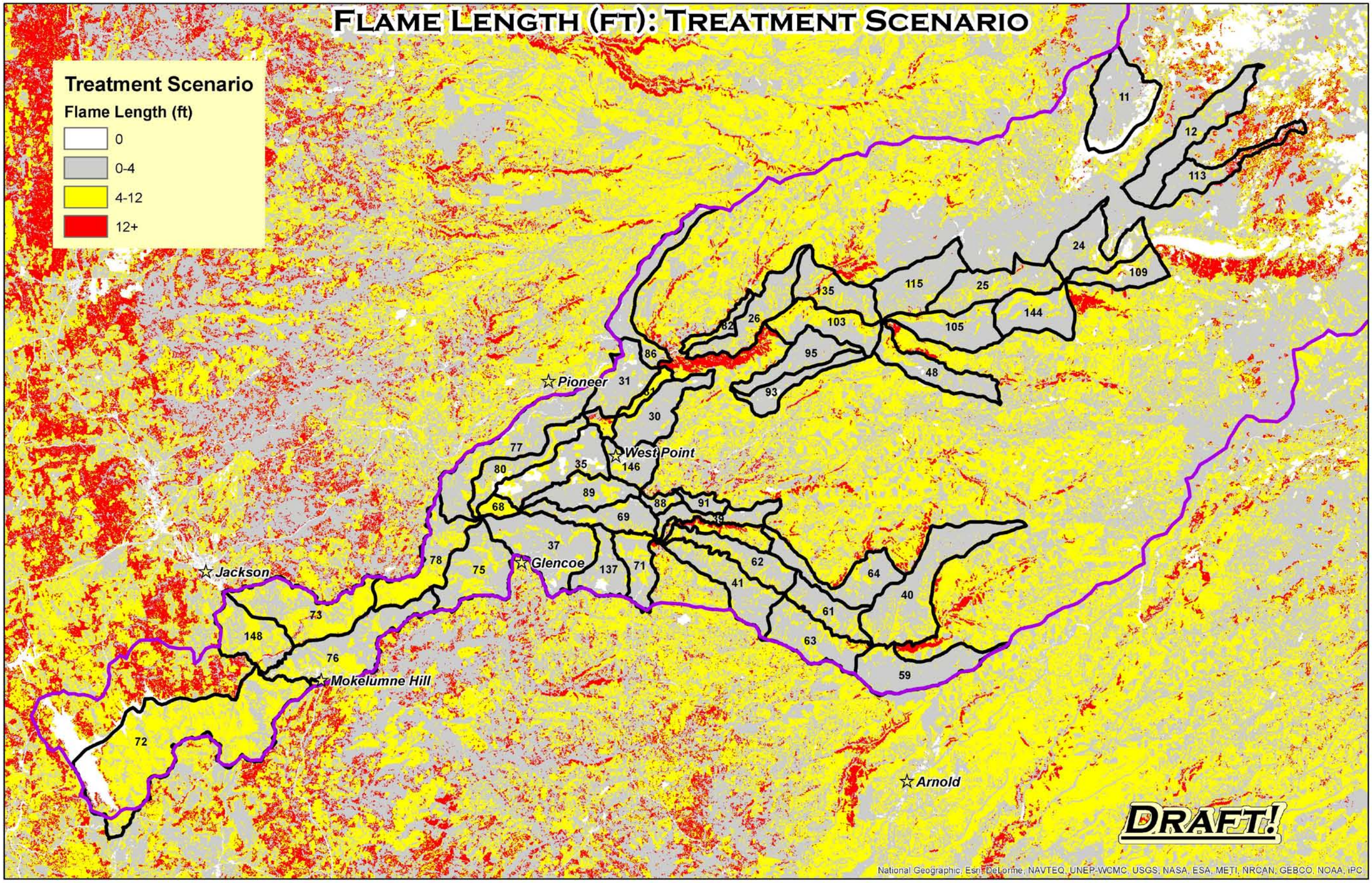
Flame Length (ft): Current Conditions



Flame Length (ft): Treatment Scenario



Next Steps

- Complete modeling process
- Calculate the Avoided Costs
- Determine strategic areas where the cost/benefit is greatest to design more specific and realistic sized-treatments