

EATON & HURST FIRES BURNED AREA EMERGENCY RESPONSE (BAER)



BAER Team
Assessment
January 27, 2025



BAER Critical Values Evaluated

➤ Human Life and Safety

- Forest Service roads, trails, & facilities
- Special uses (Non-FS)
- Private lands (Non-FS)
- County & State roads (Non-FS)

➤ Forest Service Property

- Forest Service roads, facilities, infrastructure
- Forest Service non-motorized and motorized trails

➤ Natural Resources

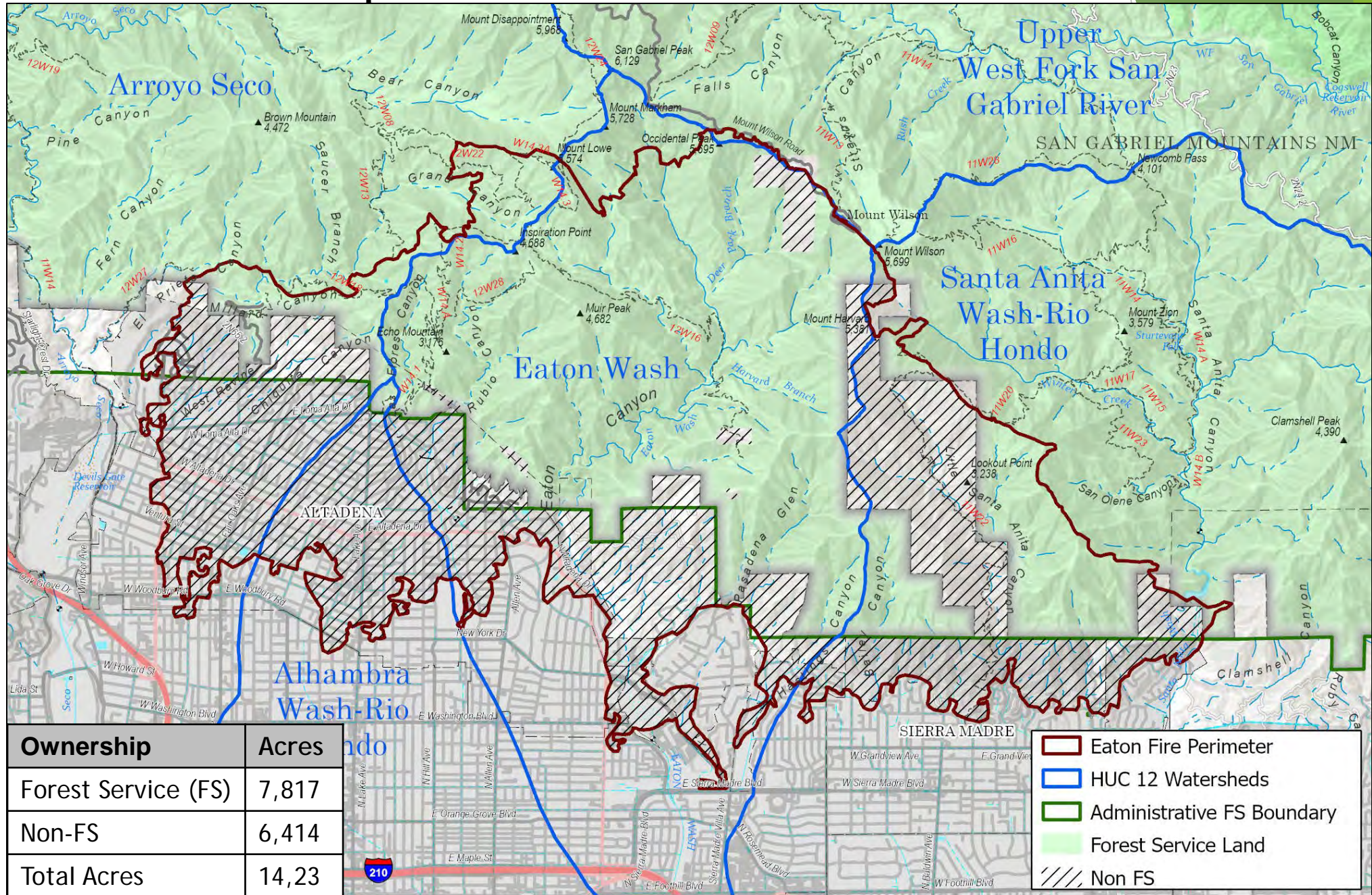
- Natural communities
- Threatened/Endangered habitats
- Soil productivity
- Hydrologic function and water quality

➤ Cultural and Heritage Resources

- Historic and prehistoric properties

<u>BAER Risk Assessment</u>			
Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High	Very High	Low
Likely	Very High	High	Low
Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

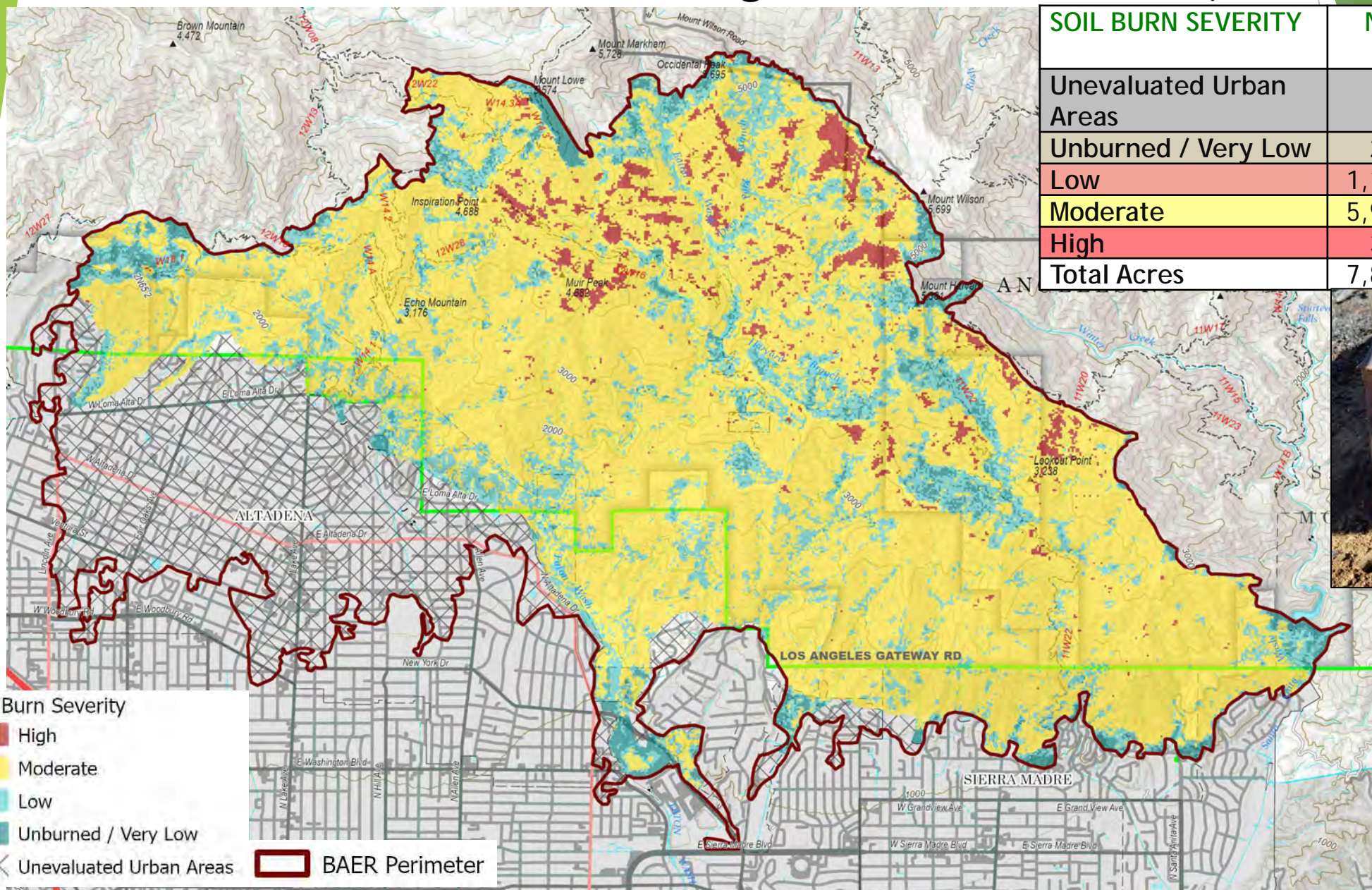
Land Ownership and Watersheds – Eaton Post-Fire



Ownership	Acres
Forest Service (FS)	7,817
Non-FS	6,414
Total Acres	14,231

- Eaton Fire Perimeter
- HUC 12 Watersheds
- Administrative FS Boundary
- Forest Service Land
- Non FS

Eaton Post-Fire Watershed Assessment Findings - Soil Burn Severity



SOIL BURN SEVERITY	NFS	NON-NFS	TOTAL ACRES
Unevaluated Urban Areas	3	2,795	2,798
Unburned / Very Low	282	253	535
Low	1,184	775	1,959
Moderate	5,985	2,506	8,490
High	364	85	448
Total Acres	7,817	6,414	14,231



Soil Burn Severity was not evaluated in the urban portion of the fire

78% of the evaluated fire area was in Moderate + High

Eaton Post-Fire Watershed Assessment Findings – Soils Summary



Extreme water repellency

- Up to 15 cm thick strong water repellency.
- Increases flow bulking (by making water flows highly efficient at transporting sediment).
- Increases runoff delivery which increases debris flow risk and quicker hydrologic response.
- Decreases water storage which increases flood flow volume.
- Decreases soil moisture for plant uptake.

Eaton Post-Fire Watershed Assessment Findings – Soils Summary



Extreme gravity and wind erosion

Eaton Post-Fire Watershed Assessment Findings – Soils Summary



Black delineations are newly exposed bedrock

Significant loss of soil productivity and soil hydrologic function in the lower elevations:

- Extreme winds removed surface soil and seed bank.
- Bedrock and subsurface soil exposed decreasing recovery potential.
- Resulting in rapid surface runoff and decreased potential for natural vegetation recovery.



Plant stems with 2" of soil removed by wind

Eaton Post-Fire Watershed Assessment Findings – Soils Summary



- Lower elevation areas experienced more wind erosion
- Upper elevation areas retained more ash and surface soil

Eaton Post-Fire

Watershed Assessment Findings – Soils Summary

Recovery

Although the lower elevation areas of the fire may have delayed recovery or site conversion (some plants will not grow back), the headwaters of the drainages will likely recover similarly to the 2020 Bobcat Fire in Santa Anita Canyon.

September 2020 after Bobcat Fire



January 2025



Eaton Post-Fire Watershed Response Flooding & Increased Flows

Life/Safety

- Campgrounds
- Roads & Trails (including crossings)

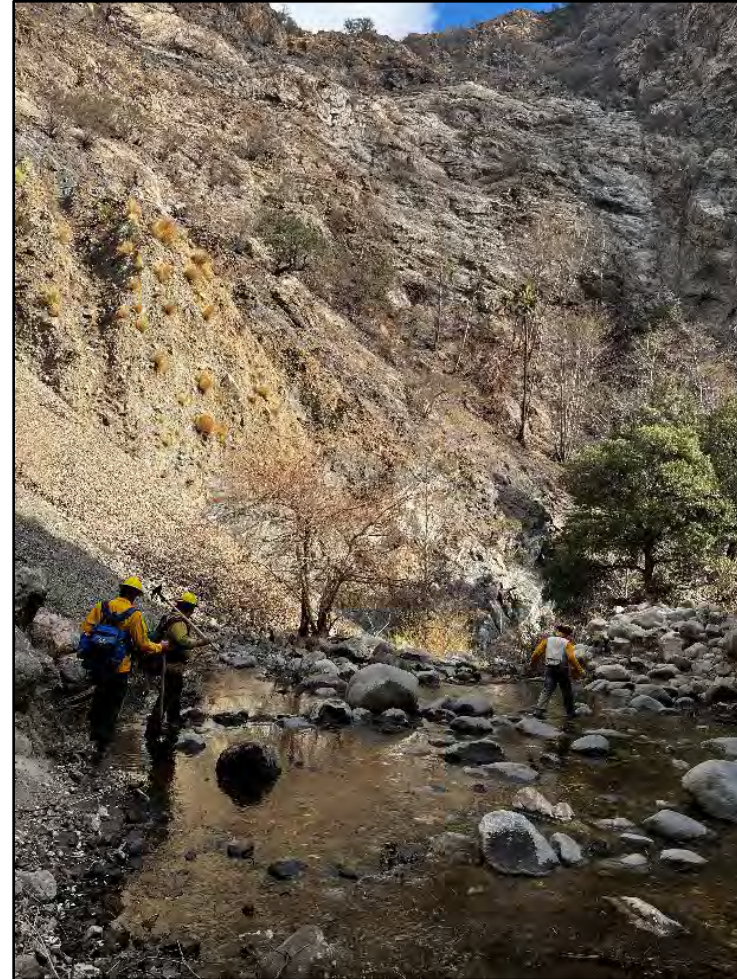
Infrastructure Within/Below Burned Area

- Roads, Bridges, Structures

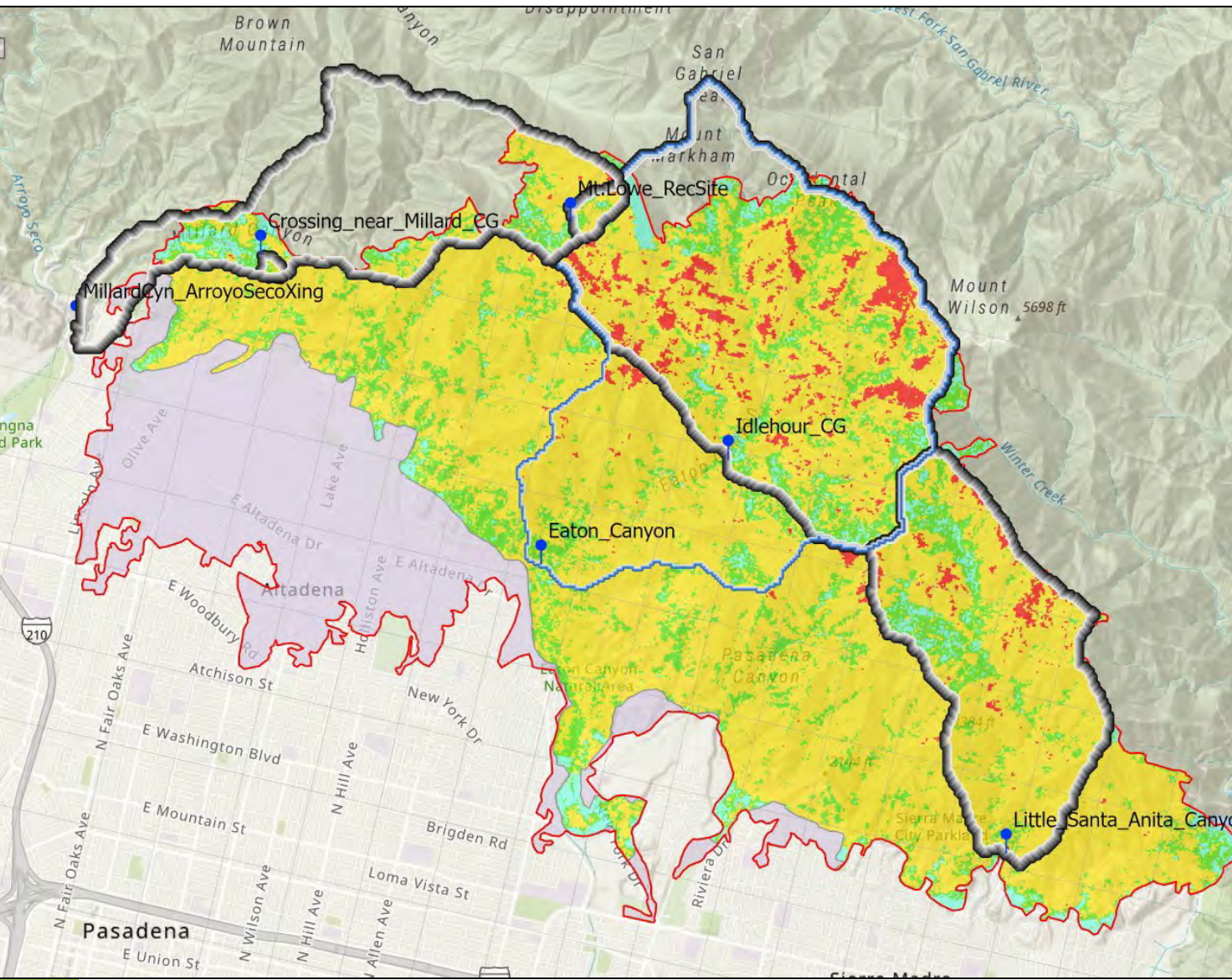
Natural Resources

- Hydrologic Function
- Threatened and Endangered Species

Water Quality (Sedimentation/Turbidity)

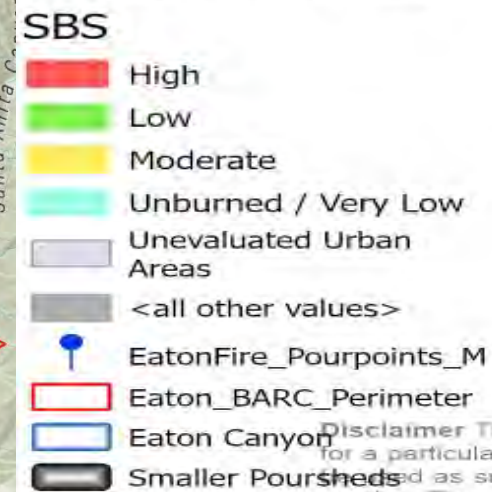


Eaton Post-Fire Watershed Response Flooding & Increased Flows



Critical Values Pour Point Watersheds	Drainage size (acres)	% Mod + High SBS	Pre-Fire Discharge (cfs) Q2	Post-Fire Discharge, Bulk (cfs)	Magnitude of Post-Fire streamflow increase w/bulking
Eaton Canyon near Falls	4,133	74%	187	2346	12.52
Idlehour CG	2,925	68%	155	1857	12.01
Crossing near Millard CG	14	71%	3	17	5.04
Mt.Lowe Rec Site	53	70%	10	70	6.87
Little Santa Anita Canyon	1,583	79%	92	986	10.71
Millard Crossing at Arroyo Seco	1,768	19%	95	426	4.51

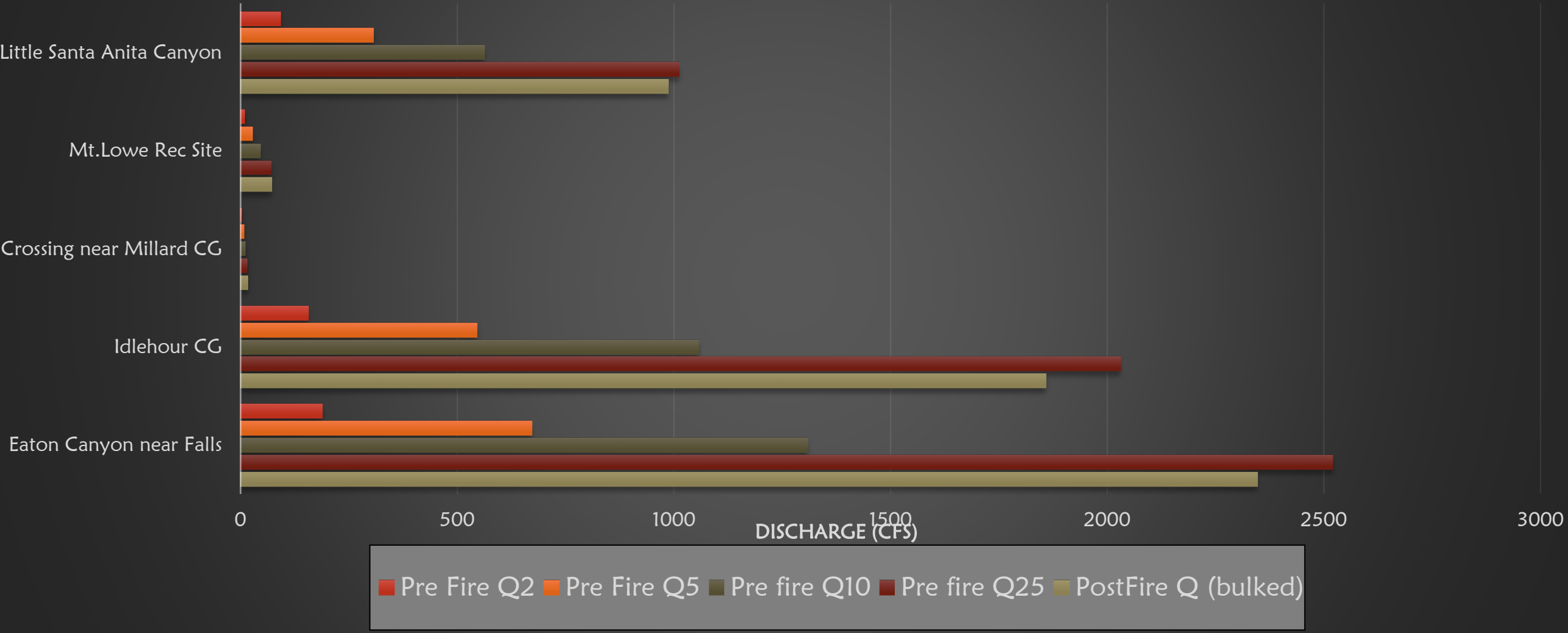
Eaton_Final_SBS



Disclaimer: This map is for informational purposes only. It is not intended to be used as a legal document. The data is based on the best available information at the time of publication.

Eaton Post-Fire Watershed Response Results

Comparison of Pre- and Post-Fire Discharges



➤ **TAKE-HOME MESSAGE:** Results show that a 2-year storm indicate flows may reach the equivalent of around or below a 25-year flood event (meaning there will be an increase of flow amounts for a less often storm event).

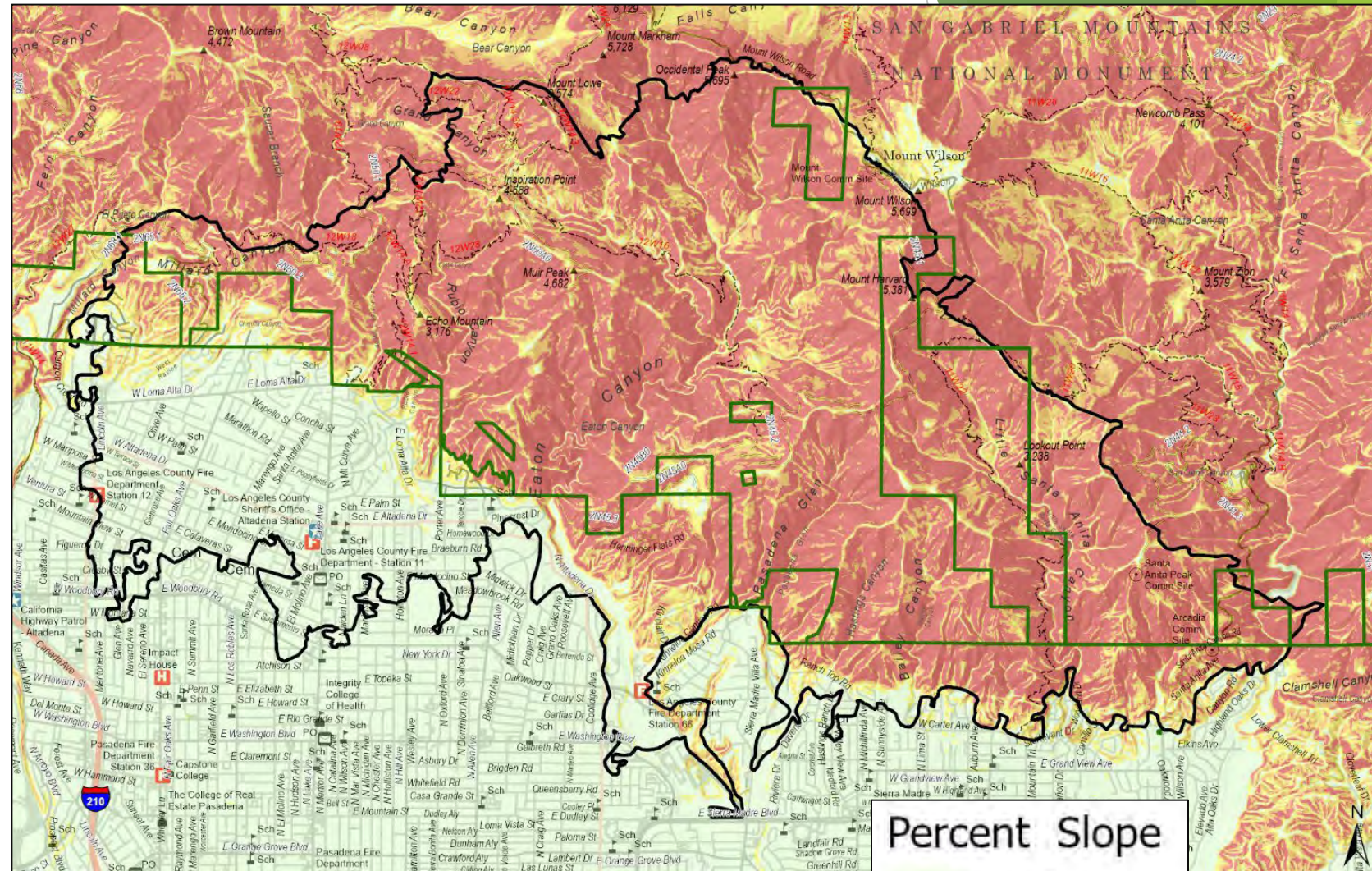
Eaton Post-Fire Watershed Response – Geology

Geo Hazards in the burn area include:

- Rock-fall
- Debris Slides
- Debris Flows
- Hyper Concentrated Flows

Geological Hazards are most likely to occur in watersheds that have:

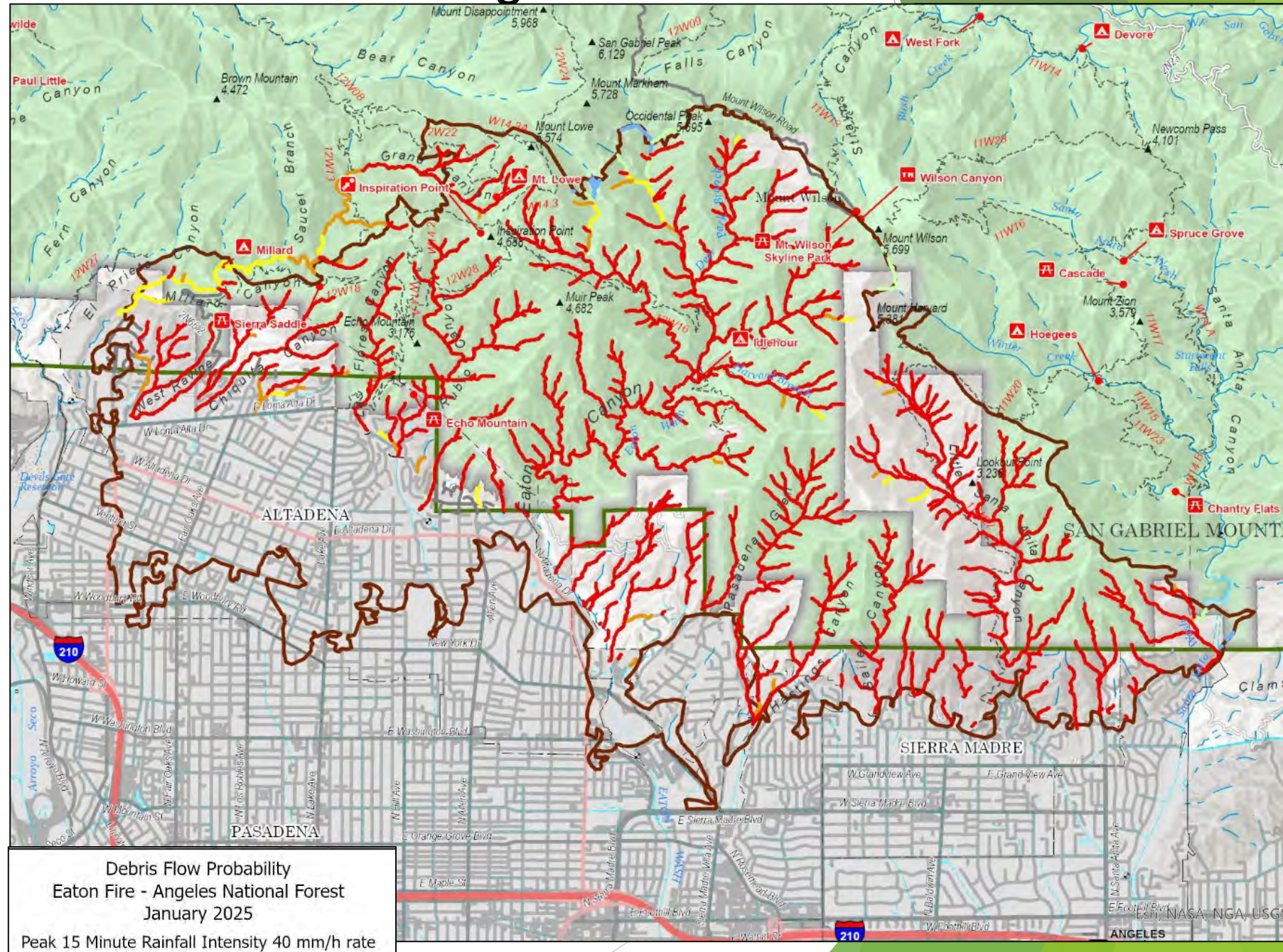
- Steep slopes
- Experienced moderate-high Soil Burn Severity
- Significant amounts of stored sediment & loose rocks on slopes and in channels



Eaton Post-Fire - Geological Hazards

USGS Debris Flow Model Findings:

- ▶ High to Very High probabilities of debris flows.
- ▶ Predicted volumes of debris flows range from 1K to over 100K cubic meters.
- ▶ High combined hazard for nearly all drainages in the burn scar.
- ▶ Magnitude of storms ranging from 12 to 20 mm/hour (0.5-0.8"/hour) have 50% probabilities of initiation of debris flows in most drainages in the burn scar.



Eaton Post-Fire - Geological Hazards

Conclusions

- Post-fire geological hazards in the burn scar present *high* threats to human life and safety and to some properties.

Treatments

- Implement a one-year closure of the whole burn scar.
- Re-evaluate the closure before the next rainy season for specific adjustments.
- Post warning & closure signs at trailheads, road ingress/entries, and campgrounds.



Eaton Post-Fire -- Forest Service Roads

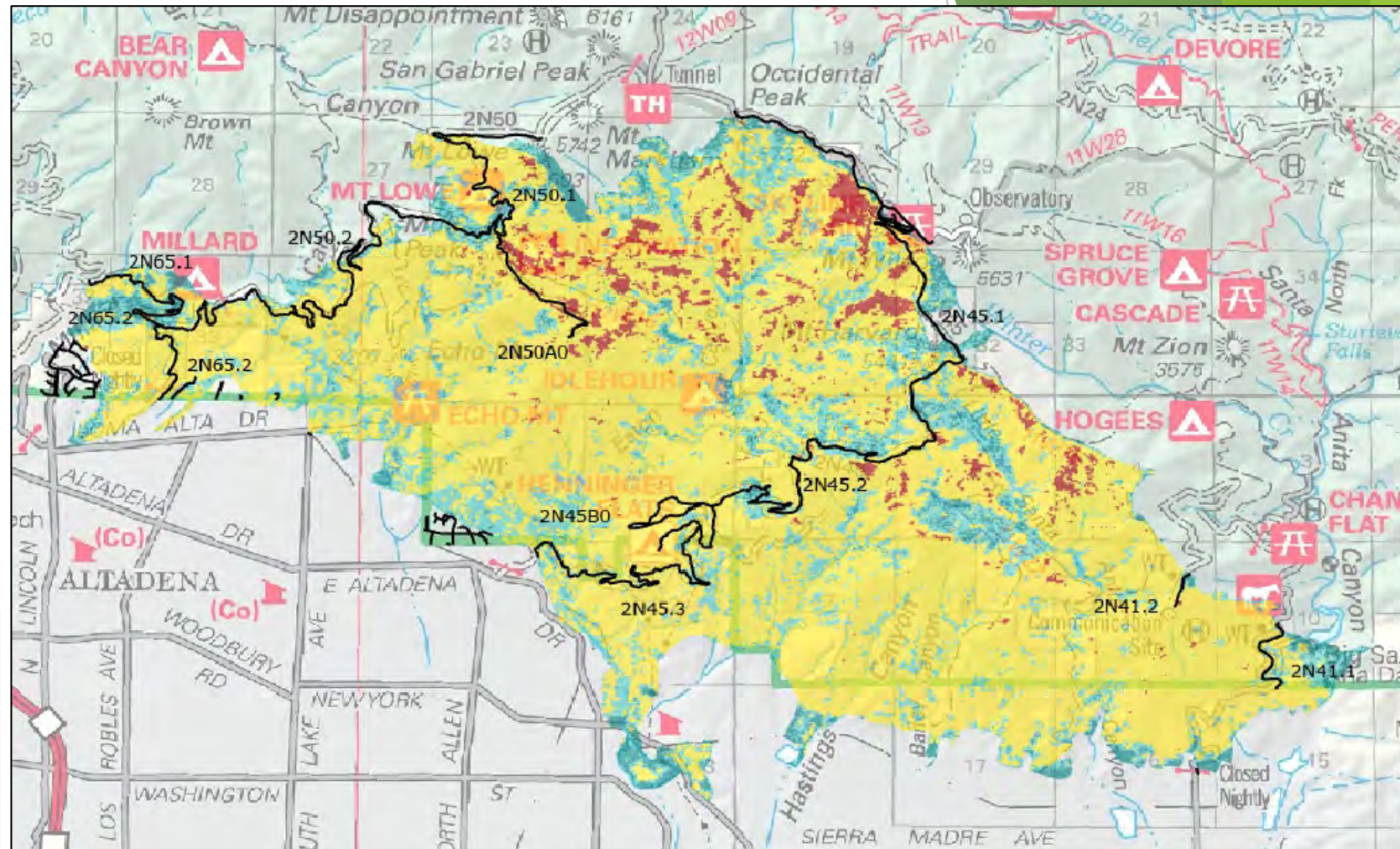
Threats

- Risk to failure of road infrastructure
- Lost access (rockfall, debris, etc.)

Assessment

- Probability of Loss/Damage: Likely
- Magnitude of Consequences: Major
- Risk Assessment: Very High

ID	Definition	Miles
FS	FOREST SERVICE	22.76
C	COUNTY, PARISH, BOROUGH	1.62
Other	Other Roads	5.15
Total Miles		29.54



Soil Burn Severity & National Forest Service Roads



Eaton Fire - Forest Service Roads

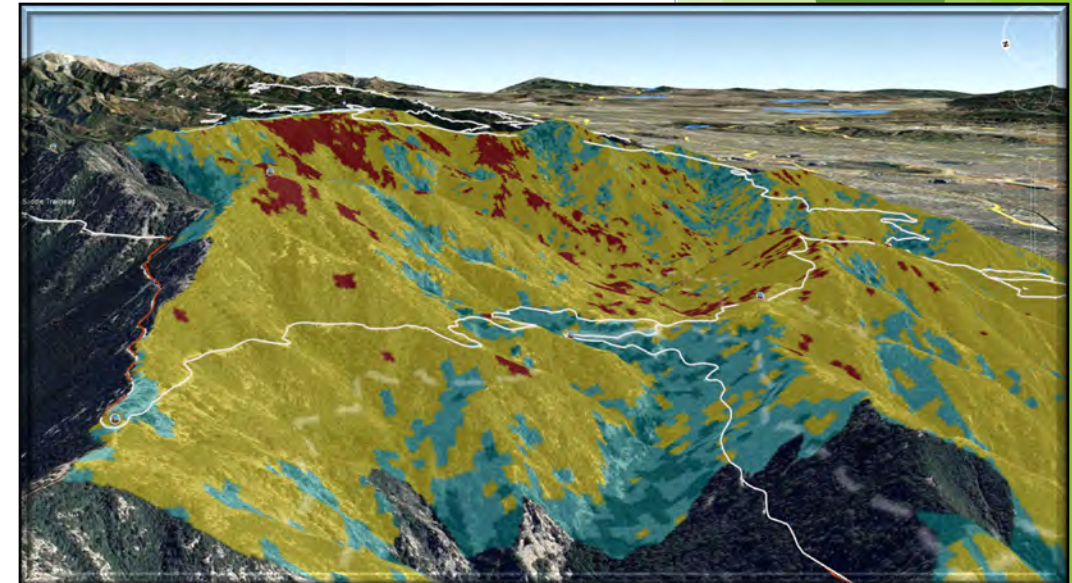
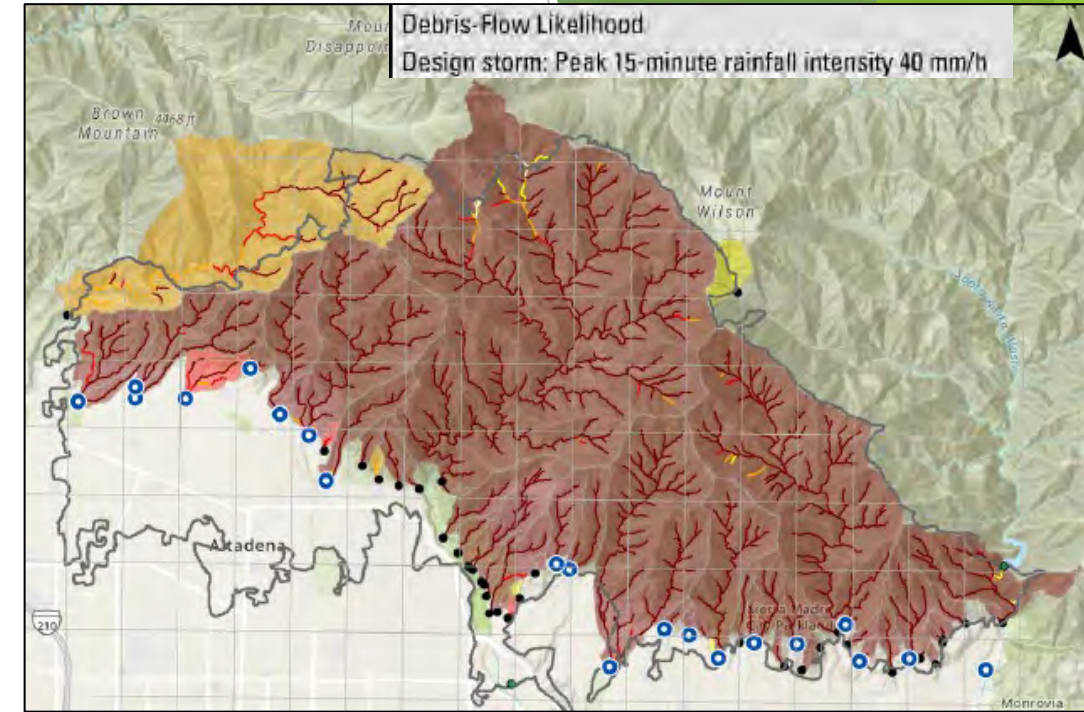
A total of 22.76 miles are within the Eaton Fire

HIGH RISK

- 11.89 miles of roads were determined to have Likely Probability of Damage and will have a Major Magnitude of Consequence leading to a High Risk.
- These are roads located on Moderate/High burn severity upslope, steep drainages, and roads with steep grades.

LOW RISK

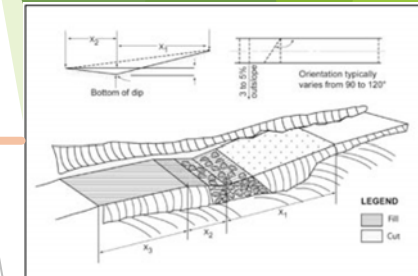
- 12.46 miles of roads were assessed to have Unlikely Probability of Damage but will have a Moderate Magnitude of Consequence leading to a Low Risk.
- These are roads located on ridgetops, in locations with Low to Unburned upslope, or in flat terrain.



Forest Service Roads – Standard BAER Treatments

Standard BAER Road Treatments

- Restore Drainage
 - Road grading, cleaning culverts, and ditch cleaning to allow water to drain off the road during storm events.
- Armor Drainage Crossings
 - Armor existing crossings to reduce road failure and reduce impacts downslope of road to protect aquatic habitat and water quality.
- Storm Inspection and Response
 - Allows the forest to inspect roads after storm events and repair any road damage found during inspection.
- Warning Sign
 - Alerts Forest Service employees and other drivers of existing or potentially hazardous conditions created by the wildfire.



Overside Drain

Warning Signs

Eaton Post-Fire - Recreation and Trails



Critical Values

- Life & Safety
- Forest Service Infrastructure/Property (Trails)

Resources Assessed

- Developed Rec Sites: 3 Campgrounds, 2 Picnic Areas, 1 Interpretive Site
- Concentrated Use Areas: Eaton Canyon, Cobb Estate
- Trails: 23 Miles Class 2 and 3 trails

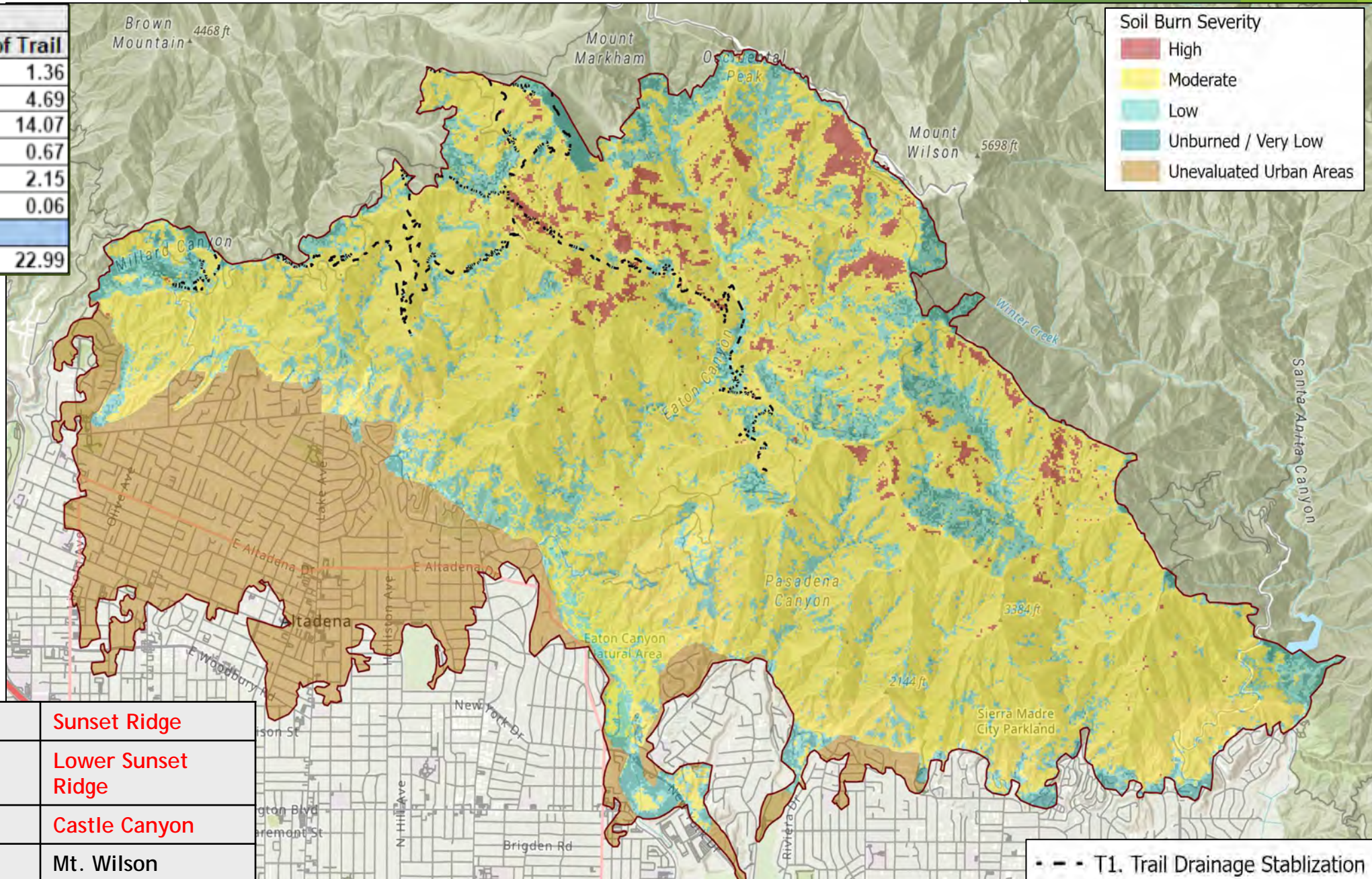


Threats

- Debris Flows and Flooding @ Eaton Canyon and Idlehour Campground
- Falls, loose soils, accelerated erosion, lost tread or features, hazard trees

Eaton Post-Fire - Recreation and Trails

Trails	
Soil Burn Severity	Miles of Trail
Unburned / Very Low	1.36
Low	4.69
Moderate	14.07
High	0.67
Outside the Fire	2.15
Unevaluated Urban Areas	0.06
Grand Total	22.99



Soil Burn Severity	
■	High
■	Moderate
■	Low
■	Unburned / Very Low
■	Unevaluated Urban Areas

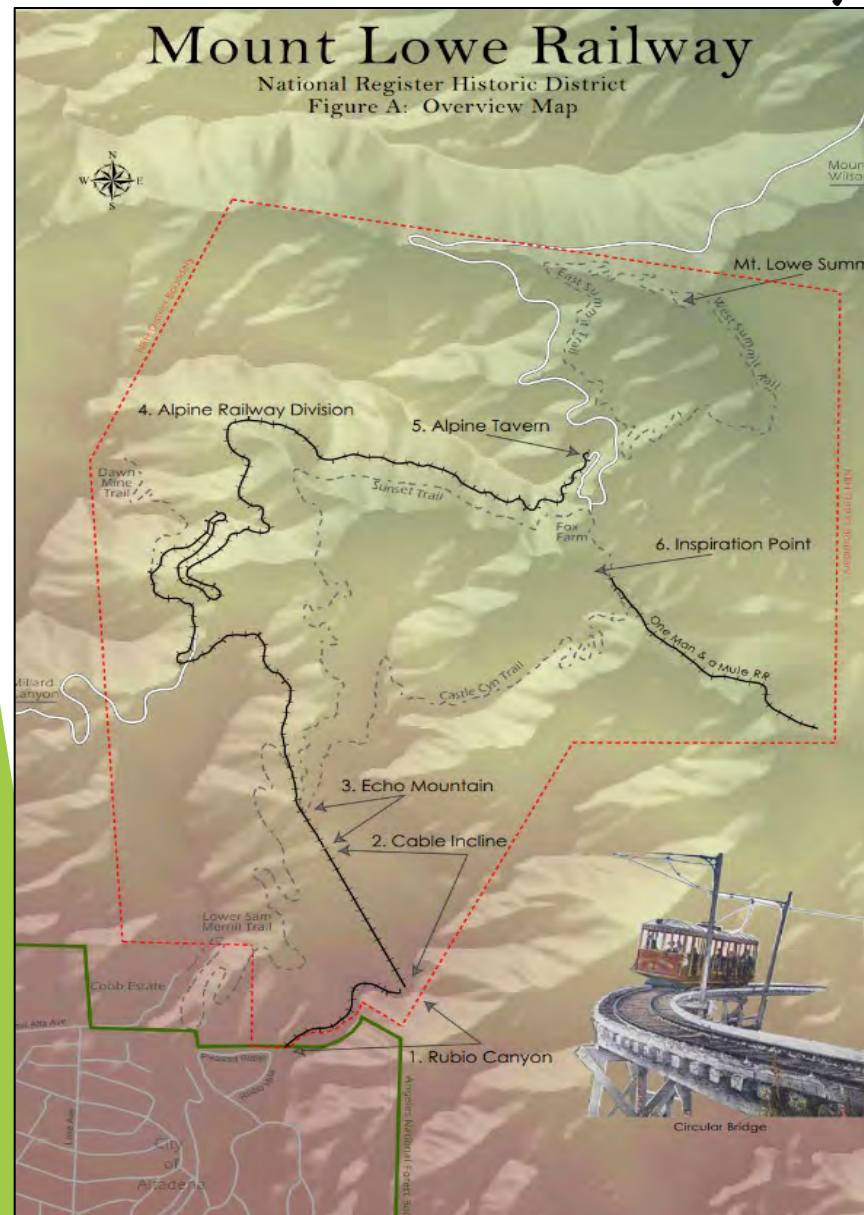
Echo Mountain	Sunset Ridge
Sam Merrill (Upper, Middle, Lower)	Lower Sunset Ridge
Mt. Lowe (East, West)	Castle Canyon
Idlehour	Mt. Wilson
Tom Sloane	Winter Creek

- - - T1. Trail Drainage Stabilization

Eaton Post-Fire - Recreation and Trails

Key Factors for Success

- Coordinate closure with neighboring jurisdictions
- Engagement with volunteer and stakeholder groups
- Integration with Heritage Program



Eaton Post-Fire - Hazmat Assessment

Critical Values

- Life & Safety
- Soil & Water Quality

Threats

- Public Hazmat Exposure
- Mobilization of Contaminants into Soil and Water



able Vault Toilet



ation Point Pavilion Burned Structure

Eaton Post-Fire - Botanical Resources

Critical Value: Native Plant Communities with Little to No Invasive Plants Present

➤ Suppression-Related Risk

- The risk to native plant communities and recovery from introduction and/or spread of non-native plants on suppression features is **HIGH**.
- Suppression activities have likely introduced non-native plants to areas in the fire; the most likely introductions would occur on dozer lines and gathering sites like drop zones.

➤ Burned Native Plant Communities – Non-Suppression Related

- The risk to native plant communities and recovery from introduction and/or spread of non-native plants away from suppression features is **HIGH** due to fire disturbance.
- Approximately 78% of fire area burned at Moderate and High severity and is at risk for weed invasion.

Eaton Post-Fire - Botany Findings

Non-Native Plants

- Much of the fire area was relatively weed-free and is mainly composed of mixed chaparral types and conifer forest.
- Many weed occurrences at the Incident Command Post (ICP) and along the access road corridors are potential vectors to spread into the fire.
- Dozer and hand lines are most likely introduction sites.



Crimson Fountaingrass



Spanish Broom



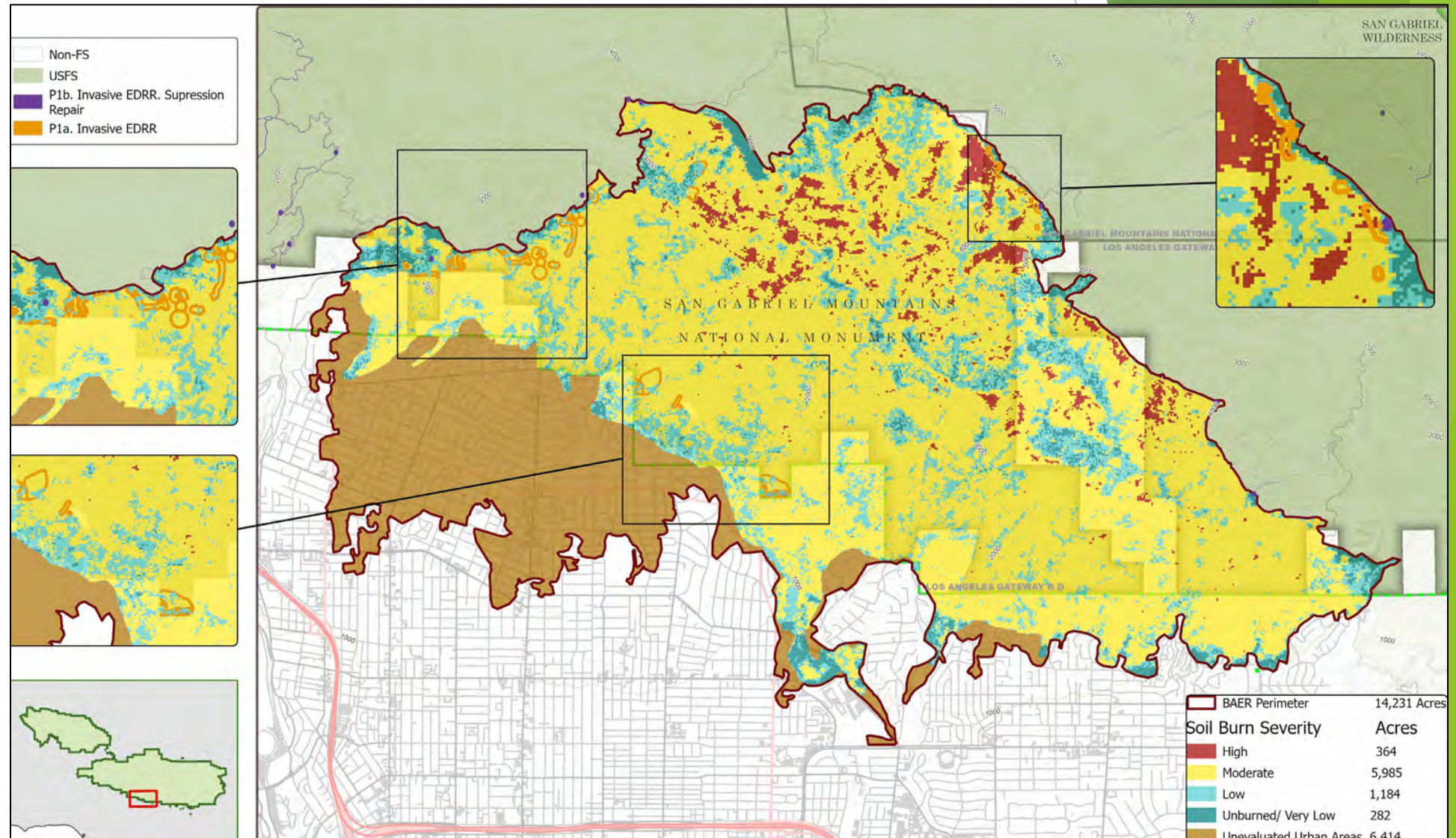
Italian Plumeless Thistle



Eaton Post-Fire - Native Plant Community Recovery

BAER Standard Treatment: Early Detection/Rapid Response (EDRR)

- **Suppression Sites – 72 acres including:**
 - Dozer line: 23 miles
 - Widened road: 8 miles
 - Handline: 7 miles
 - 4 Helispots
 - 6 Drop points
 - 5 Dozer pushes
- **Burned Slopes Away From Suppression Sites**
 - 135 acres of high priority and high-risk areas



Eaton Post-Fire - Cultural Resources

Critical Values

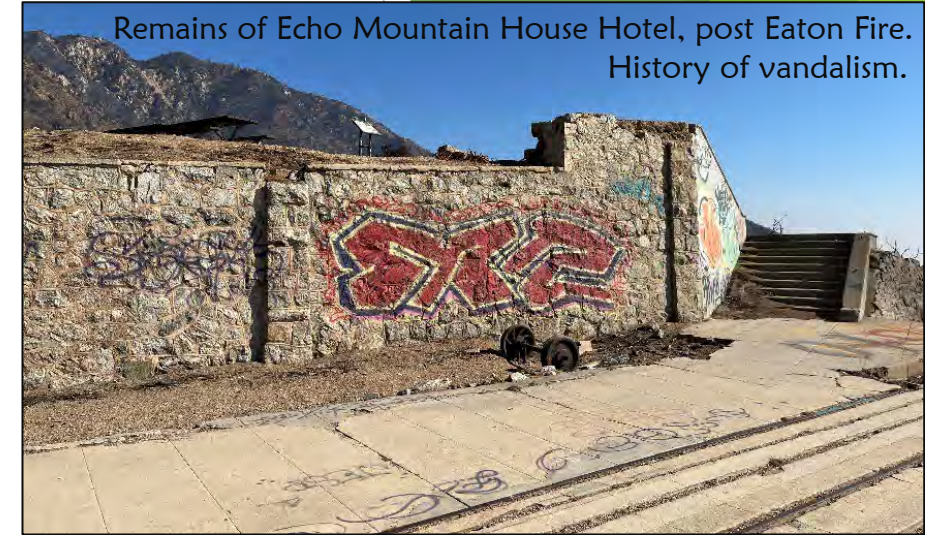
- National Register of Historic Places (NRHP) *listed, eligible or potentially eligible cultural resources*

Findings

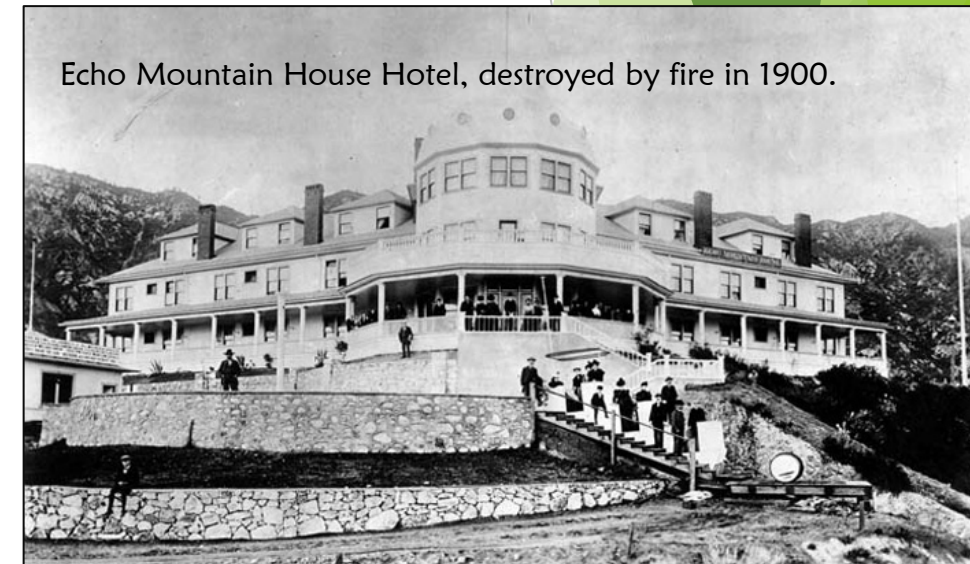
- 18 previously-identified archaeological sites in/close to the burn.
- 12 of the 18 were identified as having high or very high risk (11 of 12 are roads and trails).

Potential Threats

- Hazard Trees, and/or;
- Debris flow, sedimentation
- Looting and vandalism



Echo Mtn Trail one week after Eaton Fire and almost impassable. Railway bridge abutments visible.



Echo Mountain House Hotel, destroyed by fire in 1900.

Human Life & Safety – Summary of Proposed Closures

Administrative Closures & Signing

- Area closure of the fire area
- Road and trail closures in the fire
- Do not permit special uses events until emergency is over

Rationale for Human Life & Safety

- Geologic hazards (rock falls, debris flows, and sediment-laden flows)
- Flooding and hyper-concentrated flows
- Hazard trees
- Entrapment
- Hazmat (hazardous material) at some sites.

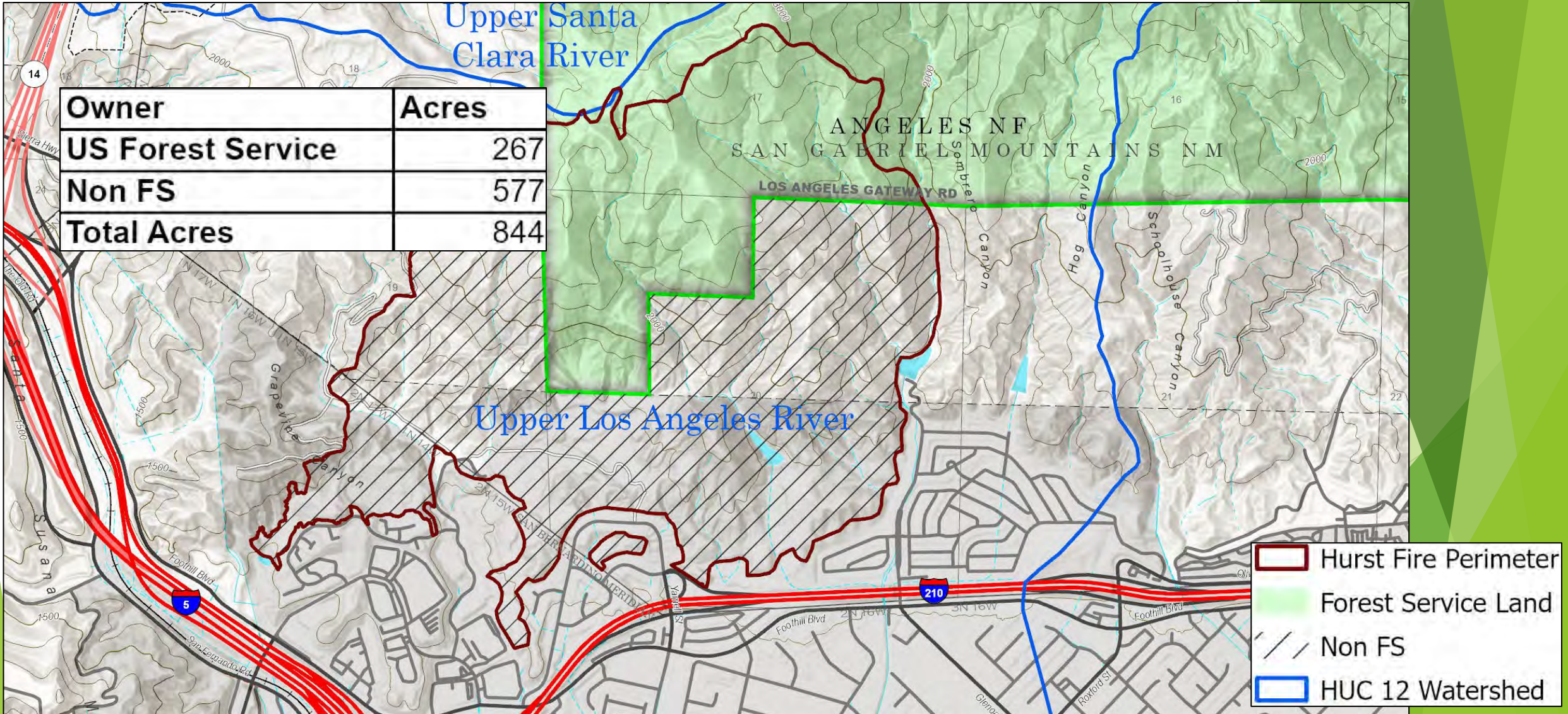
Additional Benefit of Closures

- Reduces invasive species introduction and spread
- Reduces compounded impacts that would slow vegetative recovery
- Allows for vegetative recovery without additive off highway vehicle (OHV)/mountain bike effects
- Reduces human disturbance to wildlife and plant habitats
- Reduces potential for looting of heritage resources



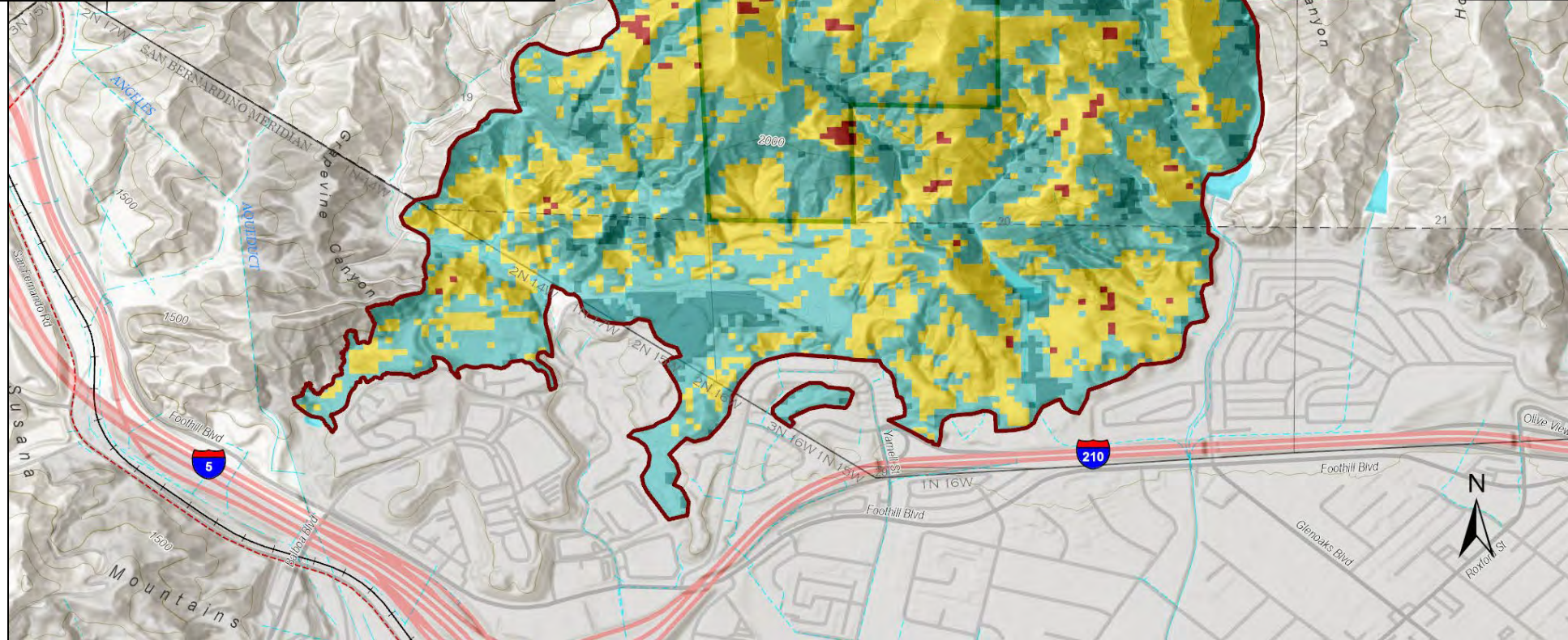
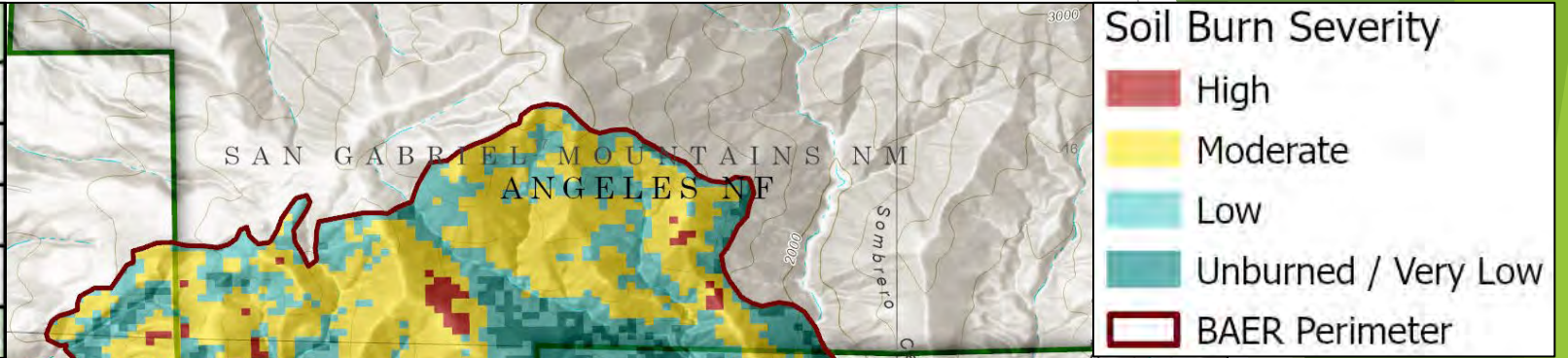
Hurst Fire

Land Ownership and Watersheds

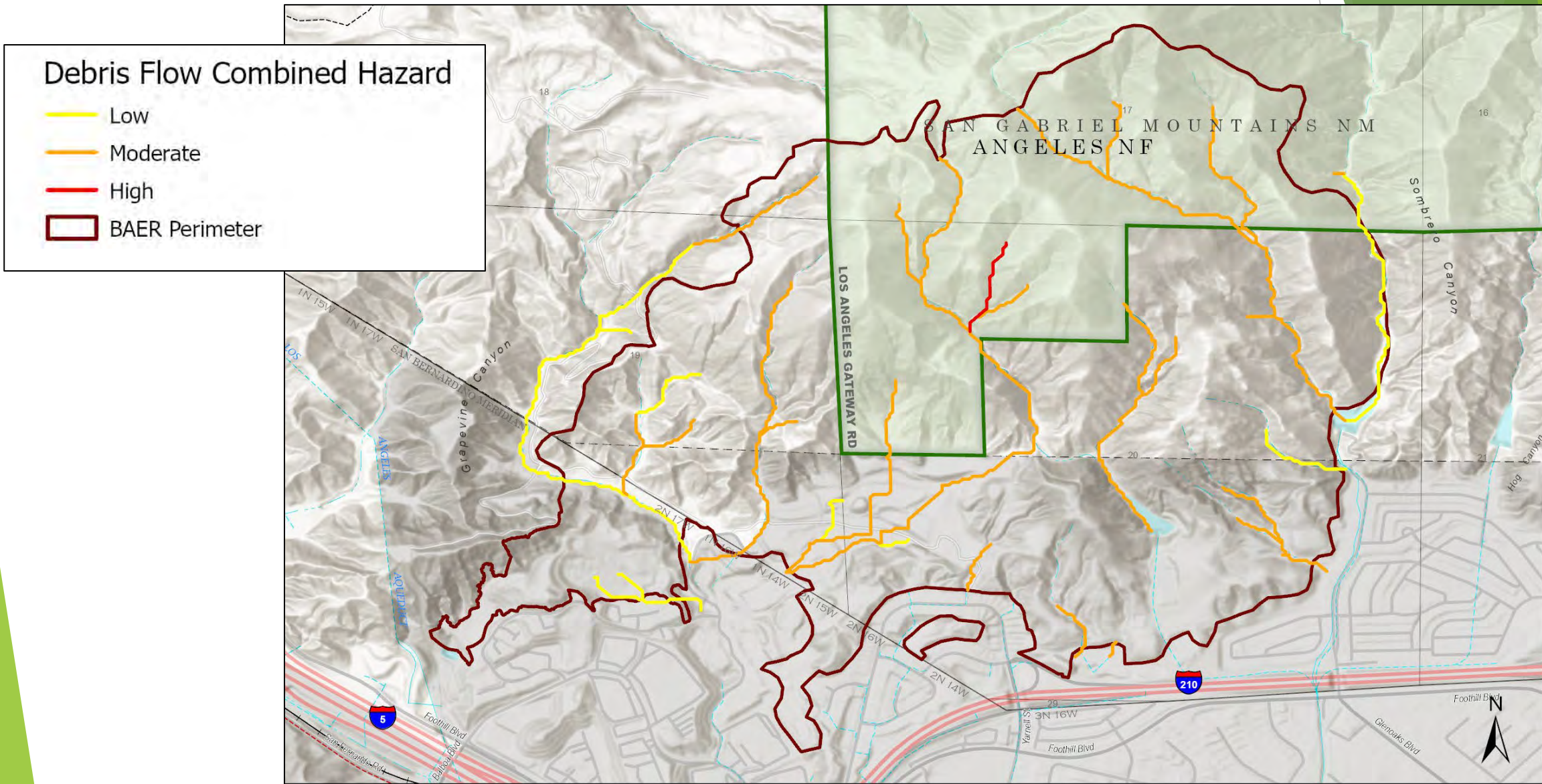


Hurst Post-Fire Watershed Assessment Findings - Soil Burn Severity

Soil Burn Severity	GIS Acres
High	13
Moderate	384
Low	386
Unburned / Very Low	61
Total Acres	844



Hurst Post-Fire Watershed Assessment Findings – Debris Flows



Hurst Post-Fire

Native Plant Community Recovery

BAER Standard Treatment: Early Detection/Rapid Response (EDRR)

➤ 16 acres (~5 miles of dozer line)



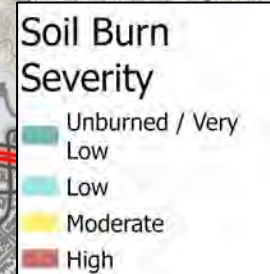
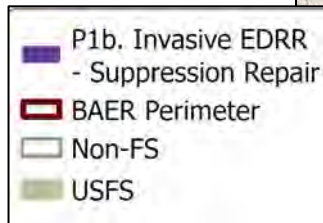
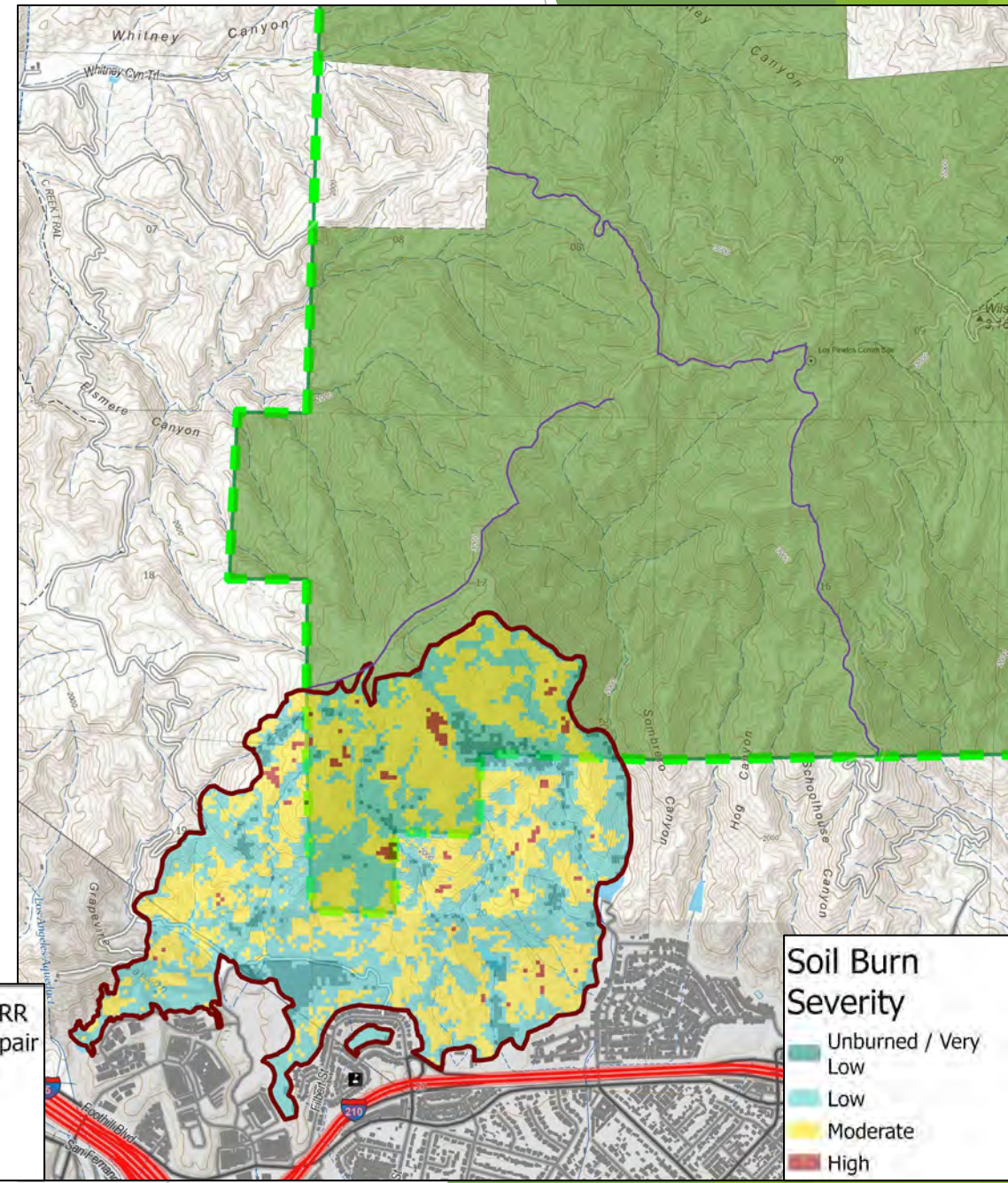
Shortpod mustard



Maltese starthistle/tocalote



Italian ryegrass



BAER SAFETY MESSAGE: Everyone near and downstream from the burned areas should remain alert and stay updated on weather conditions that may result in heavy rains and increased water runoff. Flash flooding may occur quickly during heavy rain events--be prepared to act and note emergency alerts issued by Los Angeles County. Current weather and emergency notifications can also be found at the National Weather Service website: www.weather.gov/lox/.

