Sesnon Fire

Sesnon Fire CALAC-08231953

Closed Brown's Canyon Timber Bridge with new Arizona Crossing in foreground.

State Emergency Assessment Team (SEAT) Report

DRAFT

Assessment of Watersheds in Ventura and in Los Angeles County California

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STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

The scope of the assessment and the information contained in this report should not be construed to be either comprehensive or conclusive, or to address all possible impacts that might be ascribed to the fire effect. Post fire effects in each area are unique and subject to a variety of physical and climatic factors which cannot be accurately predicted. The information in this report was developed from a cursory field examination, by licensed resource professionals and should be viewed in conjunction with other relevant sources of information. Neither the State of California or any other Agency or Department participating as a member of the State Emergency Assessment Team (SEAT) makes any warranty, express or implied, nor assume any legal liability for the information disclosed herein.

EXECUTIVE SUMMARY

SESNON FIRE
CA-LAC-08231953

Assessment of watersheds in Ventura County and in Los Angles County California

Introduction

An initial State Emergency Assessment Team (SEAT) has been deployed to Ventura and the Los Angeles Counties area to evaluate Values at Risk in the affected burn area of the Sesnon Fire. The SEAT had three key objectives:

Rapid post-fire watershed assessment and recovery operations are conducted to:

- Identify on-site and downstream threats to public health or safety from landslides, mudslides, debris torrents, flooding, road hazards, and other public safety hazards from fire related effects.
- Identify threats to resources at risk, including: excessive erosion; impaired water quality; threats to wildlife, fisheries, botanical values; other natural and cultural resources.
- Determine measures that may be used to prevent or mitigate identified threats.

The Sesnon Fire burned approximately 14,703 acres in the Bull Canyon, Simi Valley, and Eastern watersheds (see appendix maps, Figure 1). Hydrologic conditions vary significantly from the western Las Llajas Canyon to eastern Aliso Canyon. The fire resulted in high soil burn severity on 230 acres (2%) of the watershed, moderate burn severity for 5,122 acres (35%), low burn severity for 5,062 acres (34%), very low severity on 2,244 acres (15%), and unknown severity on 2,045 acres (14%) due to the lack of data (see appendix maps, Figure 5).

SEAT specialists conducted rapid surveys on burned areas to determine if emergency rehabilitation treatment is needed to minimize the risk of threats to human safety or property. These surveys may be used in conjunction with other relevant, reliable sources of information to assess if emergency rehabilitation treatment is needed to minimize or prevent deterioration of water quality, minimize loss of soil productivity due to erosion, minimize or prevent degradation of wildlife and botanical habitat, and minimize or prevent degradation of cultural and other natural resources (such as paleontological). These rapid surveys also facilitate identification of other potential values at risk, and determine if emergency rehabilitation treatment is needed.

The recommendations found in this report are to be used as a guideline for possible mitigation to decrease the possible damages to life and property. It is a rapid initial assessment to disclose Values at Risk. The treatments fall into one of two broad categories. Those treatments which can be considered temporary (short-term) measures designed to be quickly and relatively inexpensively implemented; and long-term treatments designed to facilitate the recovery of the watershed at an accelerated pace while concurrently minimizing the exposure of the Values at Risk to the threats identified.

The following information summarizes key findings contained in the initial Sesnon Fire SEAT assessment.

Loss of Human Life and Property

The principal concern with the Sesnon Fire is loss of human life and property due to an increase in the potential for in-channel floods, hyperconcentrated floods, debris torrents, mudsliding and debris flows. Houses and communities near or within stream channels near Las Llajas Canyon, Limekiln Canyon, Porter Ranch, Brown's Canyon, and Granada Hills have been specifically identified where significant in-channel floods, hyperconcentrated floods, debris torrents, mudsliding rockfall and/or debris flows are possible. In addition, possible loss of life resulting from localized debris sliding, debris flows, and sediment laden floods onto individual homes beyond the areas described previously is also possible. For approximate locations of Values at Risk for human life and property see the Technical Specialist Reports and the Risk to Lives and Property Map (see Figure 2.)

The most significant value at risk in the area of the Sesnon Fire was the Brown's Canyon Timber Bridge. The threat to human safety was so serious, that upon evaluation it was determined that the bridge needed to be closed. Two of our team engineers, determined that the bridge was a total loss. It posed a significant threat to all vehicle traffic. Earlier we had called the Los Angeles Police Department, warning them of the unsafe condition of the bridge. They had issued an alert and assigned an incident #2940 to the case. The SEAT Policy Group requested a closure order through the Governor's Office of Emergency Services (OES). It was executed by the California Highway Patrol and OES Law Enforcement Branch personnel. The bridge was officially closed on November 5, 2008 at about 3:00 pm. This location provides the only 2-wheel drive vehicle access into Brown's Canyon for the residents and visitors. Concrete barriers were installed at each end of the timber bridge to prevent further use. A temporary access was installed over the next two days. It consisted of an Arizona crossing over the creek, next to the old bridge. Vehicle traffic was allowed to cross over the new bridge approximately 15 hours later.

Watershed Evaluation

The Sesnon Fire encroached upon numerous watersheds and sub-watersheds (see Figure 3), across approximately 14,703 acres. Where fires burned hot in upper portions of the Brown's Canyon, the reduction in interception and evapotranspiration from the lack of vegetation may be additionally affected by the development of hydrophobic soils within the fire perimeter. Waxy substances released by volatized plant materials during hot fires follow thermal gradients into the soil and congeal as continuous surfaces in areas of moderate to high soil burn severity. Various levels of hydrophobic soils were found in the high and moderate soil burn severity areas with expected frequency and distribution relative to the moderate and high ratings.

The principal concern with the Sesnon Fire is an increase in the potential for in-channel floods, hyperconcentrated floods, debris torrents, mudsliding and debris flows. The primary mechanisms for this are the loss of mechanical support of hill-slope materials that was provided

by vegetation, and vegetative litter and the development of hydrophobic soils. The increase in runoff resulting from reductions in interception and infiltration, from the simplification of surficial runoff patterns, and from the loss of mechanical support along stream channels where riparian vegetation was burned will increase the hydrologic response of the watershed contributing to the increase in the potential for in-channel floods, hyperconcentrated floods, debris torrents, mudsliding and debris flows.

It is our understanding that the US Forest Service, in concert with the US Geological Survey are developing models to assess the potential magnitudes of post-fire events. These tools and maps should be shared with the public and OES representatives and made available online at www.oes.ca.gov but were not available at the time of this report.

Values at Risk

In general, as a result of the fire and the burn severity previously discussed there is an increased risk for storm events to result in flooding, debris torrents, mudsliding and debris flows. As storm intensity increases or as duration rises, there will be an increased elevation in risk for the storm event to trigger flooding, rockfall, debris torrents, mudsliding and debris flows.

A. Threats to Human Life, Property, and Infrastructure

As a result of the burn severity, reduction in vegetation, and development of hydrophobic soils, the impact to houses and the associated human occupancy, other property (e.g. campgrounds, barns, stables, water tanks, etc.) and infrastructure (e.g. roads, bridges, culverts) located within or adjacent to the fire perimeter are at an increased risk to the threat of flooding, mudsliding, debris torrents, rockfall, and debris flows. This threat includes the potential loss of life and property (see Figure 4).

The single greatest threat to life within the Sesnon Fire area was found in Brown's Canyon: **Brown's Canyon Timber Bridge** (see Engineering report). This bridge was a total loss from the fire and such a threat to public safety, that after evaluation we closed the bridge. A temporary Arizona crossing was constructed next to the bridge for local access and emergency response vehicles. Other areas where risk is high include Limekiln Canyon (near the intersection of Sesnon and Tampa Ave.) and the surrounding homes and infrastructure (a box culvert for example). In this same area, along Tampa Ave. there are high potential tree hazard risks to human life that require a tree hazard survey. Culverts, sediment basins, and v-ditches all need regular maintenance to prevent flooding and debris torrents.

View of Brown's Canyon Timber Bridge at initial inspection. View north.

Caltrans Senior bridge engineer, Bing Wu pointing out burned supports of Brown's Canyon Timber Bridge with temporary shoring (note space between beams).

Brown’s Canyon Timber bridge with burned stringers and temporary shoring with steel I-beams. View under the bridge (note space between stringers and I-beams.

Note burned condition of stringers at northwest end of the bridge and the lack of Support to the concrete slab (that seems to be unreinforced, Bing is pointing to it). View north

Caltrans engineer Bing Wu at cribbing for bridge abutments. Area burned out and failing. View south.

New Arizona crossing with old wooden bridge in background and with concrete barriers at creek crossing. View west.

While the SEAT team was still evaluating the condition of the bridge we
Posted barriers and a speed limit sign for the users of the bridge. View north.

Truck with trailer using Arizona crossing after bridge closure. View south.

One of the houses badly damaged by the Sesnon Fire.

One of the many culvert drainages almost plugged, behind one of the Housing Developments bordering the fire.

B. Threats to Water Quality

As a result of the fire and the impacts from the loss of vegetation and soil burn severity evaluation of watersheds, reservoirs, streams, and other water resources located within or near the fire perimeter are at an increased risk to the threat of flooding, rockfall, debris torrents, mudsliding and debris flows, sedimentation, and chemical pollution. The risk is greatest to Alison Canyon, Brown's Canyon, Devils Canyon, Mormon Canyon, Limekiln Canyon, and an unnamed canyon between Mormon Canyon and Limekiln Canyon (off Sesnon Road).

In many drainages ash, trash, & sediment enter the water systems in the fire areas introducing many unwanted pollutants.

C. Threats to Recreational Resources

As a result of the fire and the impacts from the loss of vegetation and burn severity evaluation of watershed, recreational resources such as hiking and biking trails are at an increased risk to the threat of flooding, rockfall, debris torrents, mudsliding and debris flows. Additionally, the removal of vegetation due to the fire or the associated suppression activities may result in the creation of new, unofficial trails in the burn area. These new trails, if not monitored or prevented, or mitigated with erosion control measures, could result in increased erosion. This risk is greatest on County, City, and State Park lands and other lands within the fire perimeter where public access is not controlled.

D. Threats to Wildlife, Botanical Values, and Fisheries

As a result of the fire and the impacts from the loss of vegetation and burn severity evaluation biological, botanical, and fisheries habitat is at an increased risk to the threat of flooding, debris torrents, mudsliding and debris flows, sedimentation, and chemical pollution. Suppression activities (e.g. "dozer lines") have also contributed to the current risk to biological, botanical, and fisheries habitat. The risk is greatest for those areas of the Sesnon Fire which contain habitat for state and federally listed rare, endangered, or threatened species, state species of special concern, and "covered species" identified in the Technical Specialist Report. Rare plants and natural communities should recover from the fire naturally. However, in areas where dozer lines were installed, restoration and intensive weed management and monitoring should occur (see Botany report for details). The threat to wildlife is that animals can be displaced from their habitat due to habitat loss, degradation, and sedimentation. The objectives for wildlife management include monitoring wildlife populations effected by the fire, identifying potential population declines in populations and encourage adaptive management.

E. Threats to Cultural Resources

As a result of the fire and the impacts from the loss of vegetation and burn severity evaluation of watersheds natural and cultural resources are at an increased risk to the threat of flooding, rockfall, debris torrents, mudsliding and debris flows. Additionally, there is an increased risk of the exposure of cultural sites as a result of the fire or the associated suppression activities removing protective vegetative cover. Pre-field work assessment and research revealed the greatest risk from the fire is to those cultural sites that have been exposed as a result of the fire or the associated suppression activities that could be vandalized or otherwise compromised.

Area Burned

The 14,703 acre Sesnon Fire started as an electrical discharge in the unincorporated area west of Limekiln Canyon road and eventually burned portions in Ventura and in Los Angeles County. The fire started on October 13, 2008 and was declared controlled on October 25, 2008.

Landowners affected by the fire include:

Mountains Recreation and Conservation Authority, California State Parks, City, County, or Regional Park/Open Space, and Private Lands

Soil Burn Severity

Soil burn severity does not depict a value but rather describes a continuum from an unburned forest floor to one in which fire has appreciably altered the physical and biological conditions of the forest floor. Soil Burn Severity on the Sesnon Fire has been determined to be as follows (see Figure 5):

High:	2%	230 ac
Moderate:	35%	5,122 ac
Low	34%	5,062 ac
Unburned/very low	15%	2,244 ac
Unknown(no data)	14%	2,045 ac

High Severity

a. Hydrophobicity—soils are strongly water repellent; they will repel water for greater than 40 seconds. Very strongly hydrophobic soils may repel water for several minutes or longer. Hydrophobicity may be from the soil surface downward, from about 1/8 of an inch in depth to many inches, or it may begin below surface.
b. Organic Ground Cover Density—less than 20% cover of litter, duff, or woody debris remains. Often fully consumed in very high severity burns.
c. Vegetation—Trees: crowns fully burned, no needles or leaves remaining. Some or many branches may be consumed. Brush: crowns partially or fully volatilized; no leaves remaining. Herbaceous plants: usually fully consumed, often including roots and sometimes, residual seed.

Moderate Severity

a. Hydrophobicity—soil will repel water for 10-40 seconds. Longer than that is strong hydrophobicity; less than that is weakly hydrophobic.
b. Organic Ground Cover Density—Approximately 20-50% density.
c. Vegetation—Trees: crowns remain but needles/leaves are singed to the extent that more than 50% of the crown is discolored (i.e., the crown of a pine tree has more than half to all the needles browned by fire). Brush: crowns remaining but leaves mostly discolored by burn. Herbaceous plants: mostly consumed, but patches remain.

Low Severity

a. Hydrophobicity—soil will repel water for less than 10 seconds. Often water will infiltrate within a second or two.
b. Organic Ground Cover Density—greater than 50% density. Often the fire will consume only fine woody debris and scorch the surface of a duff layer.
c. Vegetation—Trees: crowns remain. Fire will often only scorch the tree bole and perhaps a few lower branches on smaller trees. All or nearly all the crown will remain green. Shrubs: mostly unburned, but some scorching may be present on lower parts. Herbaceous plants: usually singed or partially burned, but will recover.

Derived from **(FRAZIER 1989).** (See Parsons (2003) for more detailed descriptions.)

Soils:

The field survey found a weak water-repellent layer in most burned areas. Due to the relatively small portions of high burn severity, it is anticipated that these effects will modestly increase erosion and the intensity of debris and mud flows and flooding downstream. Post-fire erosion on hillslopes and sediment transport in stream channels will increase and may cause erosion of canyon roads and failure of stream crossings. Additionally, there may be an increased risk of flooding depending on the frequency and intensity of winter storm events (see Figure 7).

Treatment aims at minimizing erosion on slopes and reducing sediment laden floodwaters likely to occur during first rains after the fire. Recommended Best Management Practices (BMP's) include the use of fiber rolls (straw, flax, or other material), gravel bag berms, geotextiles and Mats (erosion control blankets). Mulching, fiber rolls and straw bales with silt fencing may be used to prevent erosion at high value sites or to prevent runoff damage to specific roads or site improvements. **Timely maintenance after storm events of road drainage crossings and catch basins is essential**.

Summary

The fire and the resultant impact to the values at risk previously discussed have an increased risk for storm events to result in flooding, rockfall, debris torrents, mudslides and debris flows. As storm intensity or duration rises, there will be an associated increased elevation in risk for the storm event to trigger flooding, mudslides, rockfall, debris torrents, debris flows, and sedimentation. The threat posed by flooding, mudslides, debris torrents, and debris flows includes the loss of life and property. All Values at Risk identified could be adversely affected.

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Introduction

The State Emergency Assessment Team (SEAT) objectives have been to take appropriate action to ensure the protection of life, property, environment, natural, and cultural resources within the State Responsible Areas (SRA) of California. Through maintaining communication and partnering with multiple State agencies across California, SEAT has developed mitigations and recommendations to address the needs of communities, local cooperators, home owner associations, city and county municipalities. In an unprecedented effort to protect life, property, environment, natural and cultural resources within the State due to wildfires for the 2008 fire season a SEAT report has been developed to disclose the findings of this SEAT assessment.

Geology

I. Resource Condition Assessment:

A. Resource Setting

The 14,703-acre Sesnon fire burn area is underlain by alluvial units in the San Fernando Valley within the Northridge Hills and on the south flank of the Santa Susana Mountains. Bedding in the area is generally along the northern limb of the anticline and appears to dip to the north an average of approximately 30 degrees. This reduces the likelihood of major bedrock landslides in southern facing slopes. Overlying Saugus Formation in the Northridge Hills are very old alluvial deposits. These deposits are uplifted, deformed, have red (old) soils and are typically dense to very dense. The older unit is predominantly silt and clay and shows no trace of its original depositional geomorphology. The younger unit, although similarly uplifted, appears to be part of an alluvial fan that extended over the Northridge Hills before uplift cut it off from its source.

Overlying very old alluvial deposits in the Northridge Hills are deposits that formed as alluvial fans from the Santa Susana Mountains. These deposits are composed of sand, silt, and gravel and form recognizable alluvial fans. The fan surfaces are no longer active because continuing deformation has either elevated them above the area of deposition or because they have been buried by later alluvium. Small alluvial fans occur along the south side of the Santa Susana Mountains. Along the southern front of the Santa Susana Mountains, all major streams are incised into the surface. At the Northridge Hills, the largest stream, Limekiln Wash, has incised completely through the hills, leaving remnant surfaces as terraces. Smaller drainage courses, especially Wilbur Wash and Aliso Wash, have apparently been blocked by the Northridge Hills, causing deposition of younger alluvium on top. The surface re-emerges from beneath these younger sediments in the Northridge Hills. It is warped over the hills and buried by younger sediments again on the south side. The streams that cross the Northridge Hills, as well as others from the south and west, have built alluvial fans into the main San Fernando Valley basin south of the hills. These alluvial fans can be subdivided into young and active fan deposits on the basis of geomorphology.

Topography within the burn area ranges from gentle to very steep, with elevations ranging from about 1,000 ft above mean sea level in Chatsworth and in Granada Hills along the southern margin of the fire to about 3,500 feet at the northern limit where the fire burned up the slopes to the ridgeline north of Chatsworth and Granada Hills. Burned slopes drain into numerous primarily southern flowing watercourses discharging to the Los Angeles River and Calleguas Creek watersheds.

B. Findings

The communities of Porter Ranch, Granada Hills, and Twin Lakes are more at risk due to their proximity to steep canyons. Because these areas are located near the major drainages within the fire like Brown's Canyon, Aliso Canyon, and Limekiln Canyon, they will experience the higher risk due to flooding and debris flows. Other canyons at lower risk are Devils and Mormon Canyons, as well as the unnamed drainage between Limekiln and Brown's Canyon. Because most of these areas are inhabited year-round, we believe these areas constitute an moderate to high risk, that requires maintenance and other actions. We believe that inaction may and can lead to the loss of life on the order of many tens in these areas. The magnitude of post-fire damage will be determined by the intensity and duration of storms that impact the area.

In addition to the near-channel sites described above, Geology team members inspected houses, State Parks, campgrounds, businesses, drainages, channels, private land and other sites within and down slope from the burn area to evaluate potential risks from near-site (localized) debris flow, rock fall, floods, and other geologic hazards that may not be identified in the regional evaluation. There are about 37 at-risk sites, some with multiple homes, identified as having potential risks to lives or property are identified and listed in Appendix 1 of the Technical Specialist Report (see also Figures 7 & 8).

II. Emergency Determination

Values at Risk considered in this assessment include possible loss of life and property due to landsliding, debris flow, rock fall, debris torrents, and flooding from increased surface water runoff. In general, risks from landslides, debris flows and rock falls are possible where roads, residences or other development are located within and/or adjacent to canyon stream channels or on alluvial fans, colluvial footslopes and debris flow deposits.

It should be noted that these hazards are part of the natural processes in this environment, and that these risks were present under pre-fire conditions. Many existing structures in the burn area have been and will continue to be at risk from these hazards. The potential for these processes to be exacerbated by fire is primarily dependent upon burn severity and slope steepness, both of which are highly variable. In general, areas where burn severity is moderately high, slopes are steep, and the potential for increased hazard is greatest, are located in the sparsely populated upper reaches between Brown's Canyon and Mormon Canyon, where very little urban development has occurred. Burn severity was generally low to moderate in the remaining areas of the Sesnon fire (See Figure 5, "Fire Severity Map"). Risks to cultural, soils and biologic assets are covered in other specialist reports. Areas with moderate to high potential risks to life and property from slope instabilities exist elsewhere in the vicinity of the Sesnon fire, but assessment of sites that were not affected by the fire is beyond the scope of this evaluation.

III. Treatments/Recommendations

a) Drainage structures such as v-ditches and debris/retention basins (common in the area of the Sesnon Fire) should be cleared to contain /control runoff occurring after rains. Post-fire flooding potential information being developed by the U.S. Forest Service should be

used to evaluate risks to lives and properties near stream channels in and near the Sesnon Fire burn area.

b) The existing county road drainage systems should be inspected by the appropriate controlling agency to evaluate potential impacts from floods, hyperconcentrated floods, debris torrents, debris flows and sedimentation resulting from winter rains.

c) Campgrounds and hiking trails should be signed and seasonal use should be restricted as needed by the responsible agencies and/or private organizations to protect campers and hikers and potential risks should be disclosed.

d) The sites identified in Appendix 1 of the Technical Specialist Geology review should be evaluated by Professional Geologists or Professional Engineers with experience in slope stability and debris flow hazard identification and mitigation to fully document the scope of the problems at each site.

Discussion: There are two main risks to lives from a geologic perspective; (1) possible loss of life resulting from catastrophic debris flows onto communities built at the bottom of large drainages (Limekiln Canyon, Aliso Canyon, Brown's Canyon), and (2) possible loss of life resulting from localized debris sliding, debris flows, and sediment laden floods onto individual homes identified in Appendix 1 of the Technical Specialist Geology review. Risks to property and infrastructure include county roads, State Highways, water systems, and residential property. The primary recommendation to mitigate these risks is to inform and educate the individual homeowners, affected communities, local emergency agencies (Ventura/Los Angeles County), and policy makers of the risks at hand. Mitigations such as evacuation procedures, warning systems, and site specific mitigations can then be developed and implemented.

References – See attached Geology Technical Report

Hydrology

I. Resource Condition Assessment

A. Resource Setting

The Sesnon Fire burned 14,703 acres in Los Angeles and Ventura Counties. The burn area covers that part of Santa Susana Mountains north of San Fernando Valley and Simi Valley. Topography consists of mild to very-steep slopes, ranging from more than 3,400 feet above mean sea level, along the Oat Mountain ridgeline in the north, to an elevation of approximately 1,000 feet along 118 Freeway in the south. The 50-year 24-hour rainfall intensity ranges from 11 to 12.5 inches.

The burn area falls into Southern California Coastal sub-region (USGS HUC 1807), and Ventura-San Gabriel Coastal basin (USGS HUC 180701). The Sesnon fire burned portions of the following three HUC-8 hydrologic units: Bull Canyon, Eastern, and Simi Valley.

These three watersheds were subdivided into 8 uniquely named sub-watersheds for reference (see appendix, Figure 3); each of them represents a separate drainage. More than 80 percent of the burn is within the Bull Canyon hydrologic sub-area. A number of creeks originate from the upper portion of the Santa Susana Mountains, flow into the urban area of San Fernando Valley in the south, and empty into the Los Angeles River. From west to east, they are the Santa Susana Pass Creek, Brown's Canyon, Limekiln Canyon, Aliso Canyon, and Bull Creek.

Similarly, the burn in Simi Valley hydrologic sub-area was divided into two sub-watersheds: Las Llajas Canyon and Hummingbird Canyon, both of these are tributary to Arroyo Simi, and eventually join Calleguas Creek.

Only a very small portion of the burn area spreads cross the ridgeline of the Santa Susana Mountains, which is the boundary between the Santa Clara and Los Angeles River watersheds. The Santa Clara River watershed burn consists of a number of small patches distributed along the ridgeline more than 8 miles long from east to west. Collectively they were referenced as Santa Clara sub-watershed in this report (see Hydrology section report).

II. Findings of the On-The-Ground Survey

Generally, roads, railways, tunnels, debris catch basins and culverts in the burned area were not directly impacted by fire. A timber bridge was burned, and its structural integrity appears compromised, posing high risk to vehicles and passengers traveling on it, requiring immediate action. At a few locations, roadside guardrails were damaged by fire and need repairs.

The provided Burned Area Reflectance Classification (BARC) map had a highly accurate perimeter (See Figure 5). Field verification revealed some areas marked high burn severity were actually low to moderate. Overall, the conditions in the field, agree with the BARC map. The burned severity map was updated to match field findings.

A. Identify Values at Risk

Values at Risk identified in the Sesnon fire assessment are loss of human life and property due to increases in potential in-channel floods, hyper-concentrated floods, debris torrents, and debris flows. Additionally, bridges, roads, railways, tunnels, culverts, and water supply infrastructures may be at risk to increased creek flows and potential clogging of culverts and drainage structures by debris. The watershed is the resource of concern in this report. Watershed threats include higher than normal flows with possible bulking/debris flow in rain events. The Risk for flooding and debris flow increases proportionally with rainfall intensity throughout the Sesnon Fire basins and adjacent areas.

III. Emergency Determination

There are sites posing imminent threats to human life and properties, requiring immediate action to reduce their risk. The structure of the timber bridge on Brown’s Canyon Road was severely damaged by fire, and needs to be closed and repaired immediately. The actual design/construction of the bridge needs to be done by professional engineers, and is beyond the scope of this report.

The result of the moderate to high burn severity in some areas within Sesnon Fire perimeter left high potential for large scale flooding and debris flow during light to moderate rainfall events. The possibility and likelihood of increased runoff and debris flow during rain events puts all resources at an increased risk. Generally, water resources, roads, trails, and bridges in the burned area were not directly impacted by fire and appear to be in satisfactory condition; however, a number of culverts were not very well maintained, and were partially or completely plugged. This would cause flooding in impacted areas, and some roads within the burned areas are in danger of washout from

flooding and jamming of culverts with debris flow. These culverts should be cleared before the coming rain season.

Fire may introduce excessive amounts of slope erosion at locations adjacent to homes and roads. Erosion control best management practices (BMPs) such as fiber rolls or seeding need to be implemented at critical locations.

IV. Treatments to Mitigate the Emergency

Treatments for the burn area will be very difficult, impractical or unnecessary because of topography, sparseness of urban development and the fact that many of these symptoms were pre-existing, and the likelihood of rain in coming months.
The following items can be done to reduce impacts from the fire:

1. Remove burned trees hanging over roads where they may cause personal injury.
2. Remove burned woody debris at culvert inlets where they may cause water flow obstructions.
3. Clean and clear existing sediment and debris at culverts
4. Install fine sediment and large debris catchments above culverts.
5. Build concrete barriers or ditches to retain sediment behind certain homes subject to higher risk of debris flow and mud slide.
6. Assess and repair burned retaining walls, roadway guard rails, and bridges.
7. Stabilize slopes by implementing engineering practice or applying sediment control BMPs.

Treatment Objective:

Protect life, property, and natural and cultural resources.

V. Discussion/Summary/Recommendations

Prepare for higher than normal flows with possible bulking/debris flow in all rain events. The risk for flooding and debris flow increases proportionally with rainfall intensity throughout the Sesnon Fire basins and adjacent areas.

Monitor debris flow and run-off, build warning systems, and collect data for verification of existing hydrology model and for building of new post-fire hydrology models.

Monitor all public and private roads and hiking trails for safety during rain events.
Clear and maintain all debris basins, culverts, and other sediment/run-off handling structures.

The responsible government agencies should develop and adhere to emergency response plans for heavy rain events.

VI. References – See attached Hydrology/Engineering Technical Report

Water Quality

I. Resource Setting

The 14,703 acre Sesnon fire burned portions of Federal, State, City and Private lands in October 2008. Headwater portions of the Simi Valley Watershed (designated as the Calleguas Creek Watershed by the Los Angeles Regional Water Quality Control Board (LARWQCB)), Bull Canyon Watershed (designated as the Los Angeles River Watershed by the LARWQCB) and Eastern Watershed (designated as the Santa Clara River Watershed by the LARWQCB) were burned.

II. Findings of the On the Ground Survey

This report focuses on potential adverse impacts to water quality and beneficial uses to surface and groundwater resources in areas affected directly or indirectly by the fire.

On-site inspections of canyons and hillsides burned during the fire, as well as residential areas within or adjacent to burned areas, were conducted over several days to evaluate the potential for increased runoff and higher contaminant loadings resulting in adverse water quality impacts within the fire area and in areas downstream and downwind of the burn areas.

Surface water resources (lakes and streams) within the fire area and areas downstream are likely to be affected by increases in flow, higher sediment loadings and higher contaminant loadings (especially increases in pH, nutrients, metals and some organic constituents) following rainfall events. Surface waters within the fire area and in areas downwind of the fire are likely to be affected by aerial deposition of contaminants associated with smoke and ash carried by prevailing winds during the fire and from ash residues transported by winds after the fire. Releases of raw sewage into waterways may occur through rupture or flooding of sewage systems. Impacts to groundwater resources utilized as municipal water supplies could occur in affected areas due to increases in contaminant loadings associated with runoff from burned areas.

III. Emergency Determination

Although post-fire runoff and aerial deposition from ash and smoke may produce adverse water quality impacts, the fire is not expected to result in any emergency conditions with respect to water quality, sewage systems or municipal water supplies.

IV. Treatments/Recommendations

Notify county public health agencies and local water purveyors of possible risk of sewage spills and groundwater contamination in areas potentially affected by storm-water runoff from burned areas. Runoff from burned areas is generally higher than normal and contains higher sediment and contaminant loadings than runoff from unburned areas. However, the impact of metals, nutrients, and organic contaminants from post-fire runoff on water quality, habitat conditions and biological communities in streams and other waterways is poorly understood. The Southern California Storm-water Monitoring Coalition has developed recommendations for monitoring burned and unburned areas prior to, during and following the rainy season following major fires which should be funded and implemented.

Soils

I. Resource Condition Assessment

A. Resource Setting

The 14,703 acre Sesnon Fire burned federal, state, and private lands (see Figure 9). This assessment is an evaluation of soil conditions in the burned areas upslope of assets at risk. Areas evaluated are Oat Mountain to the north and west, from Las Llajas Canyon in Ventura County to Aliso Canyon on the eastern perimeter. The foothills are bounded on the south by the communities of Porter Ranch, Twin Lakes, Indian Hills and residential areas south of Evening Sky Road in Ventura County.

Potential features at risk from debris flows, mudslides and flooding identified by the State Emergency Assessment Team (SEAT) include: people, homes, water supplies, wildlife, drainage crossings, roads, bridges and parks.

II. Findings of the On-the-Ground Survey

The field survey found a weak water repellent layer at the contact between soil surface and overlying ash and/or litter layers of most burned areas and a more persistent water repellent layer in the smaller, high burn areas. Shallow water repellent layers are expected to break down during the first winter storms. Hydrophobicity was determined to range generally from moderate to low, with patches of high in a few locations. This is consistent with the burn severity acreages as shown in Table 1. It should be noted that the BARC map provided did not have data for the north western portion of the burn: this area is designated as unknown in Table 1. Burn severity classes are based on guidelines developed by Frazier (1989).

Due to relatively small portions of high burn severity, it is anticipated that these effects will modestly increase erosion and the intensity of debris and mud flows and flooding within the watershed. Erosion severity is influenced by topography, including slope, and climactic factors, such as duration, intensity and amount of rainfall. Slopes observed while investigating Values at Risk ranged from 20%, to more than 60%. Soil texture can influence erosion potential: soil texture observed during the assessment was determined to be largely medium-coarse to coarse, indicating a high potential for erosion. Types of erosion that can occur include sheet and rill erosion, soil creep, and mass wasting.

III. Recommendations

Landscape type erosion control treatments are impractical for treating the entire fire area, but mulching, fiber rolls and straw bales with silt fencing may be used to prevent erosion at high value sites or to prevent runoff damage to specific roads or site improvements.

Timely maintenance after storm events of road drainage crossings and catch basins can help keep roads open and homes safe.

In addition to sediment from hillslopes, erosion from unpaved roads and unmitigated firelines can also be sources of sediment.

In order to reduce impacts of un-regulated off-highway use, especially along steep slopes, it is recommended that signs be posted to deter such activities. Road access could also be limited by maintaining locked gates at entrance points to major roads.

IV. References – See attached Soils Technical Report

Civil Engineering

I. Resource Condition Assessment:

A. Resource Setting

The State Emergency Assessment Team (SEAT) assigned to the 14,703-acre Sesnon Fire inspected the burned area October 29, 2008 through November 7, 2008, as an entire team and with specialist groups. The burn area is located in both the Santa Susana Mountains and Simi Hills, which are part of the east-west trending transverse ranges in southern California. Burn area elevations span from 3,747 feet at Oat Mountain Peak, to around 1,000 feet in the Santa Susana Pass State Historic Park.

Fires greatly alter physical characteristics of hillside slopes, stripping natural protective vegetation cover, organic litter and removing barriers that stabilize soil and hold sediment. In addition, chaparral vegetation in Southern California has a natural tendency to develop water repellent soils due to their naturally high wax content. This water repellency dramatically increases after a wildfire because waxes vaporize and are driven into the soil by heat. Water repellency reduces infiltration and increases runoff rates. According to the U.S. Forest Service (US Forest Service Gen.Tech.Rep. RMRS-GTR-63.2000), peak flows increase 500 to 9,600 percent during the first year after a fire. As a result, burned watersheds generally respond to runoff faster than unburned watersheds and commonly produce flash floods, debris flows, and landslides, which can be devastating to property and human life.

II. Findings of the On-the-Ground Survey

Multiple residential structures were damaged or destroyed by the fire. Two key infrastructure debris basins need remediation, (Brown's Canyon Concrete Bridge and Debris Basin and Brown's Canyon Sediment Disposal Site). One fire road needs repair to alleviate future failure (Near Sulfur Springs Guzzler). One bridge was destroyed beyond repair (Brown's Canyon Timber Bridge) [see Figure 7].

In addition to the above listed areas, lives and property are potentially at risk at sites in flood prone areas, or on roads where flash flooding causes washouts due to runoff in excess of culvert capacity. In this area, known for consistent high winds, additional hazards can be falling burned and dead trees and limbs along major street corridors or hiking and equestrian trails. Regional water quality supply is potentially at risk from loss of water control on hill slopes. More information is covered in the Hydrology, Geology, Wildlife, and Botany reports for this fire assessment, which also reference the above-mentioned sites.

III. Emergency Determinations

Brown's Canyon Timber Bridge

- The Brown's Canyon Timber Bridge is the only access to the community of five ranches, horse-boarding operations and a park.
- All of the timber structure has been compromised by fire damage. The bridge can be described as a "total loss".

- Temporary supports/shoring will constrict creek flow and eventually settle.
- The structure is a danger to trespassing pedestrians and animals.
- Sulfur Springs Guzzler, Brown's Canyon Concrete Bridge and Debris Basin and Brown's Canyon Sediment Disposal Site should be remediated as soon as possible by affected agencies.

IV. Treatments/Recommendations

Brown's Canyon Timber Bridge

- The existing timber bridge needs to be removed and replaced.
- The new bridge should be designed for ease of maintenance in this remote area, and of sufficient freeboard to allow for 100-year rainfall flows.
- A 24-foot roadway width should be considered as a minimum, with guardrail and handrail on both sides.
- As seen in the results of the current fire, the new bridge should be designed with fire resistance in mind.
- A study needs to be performed to determine the optimum design for the new bridge.

Sulphur Springs Guzzler

- The running water needs to be canalized.
- The water can be split between the drinking basin and the remainder can be put into the drainage on the east side of the fire road.
- A catch basin style structure needs to be built adjacent to the artesian well and a CMP pipe can be placed into the roadway to transport the water to the drinking basin where another pipe (water canon style) should spill the overflow into the drainage below.
- The fire road may require a retaining structure to bring it back to a passable width.
- Batter board and bulkhead pile and lagging retaining walls would be recommended.
- Further analysis and a repair design for the fire road should be prepared by the agency controlling this area within the near future.

Brown's Canyon Concrete Bridge and Debris Basin

- The debris built up in the barrels of the bridge structure needs to be carefully removed.
- This action can be performed in combination with the clearing of the debris basin on the west side of the bridge.
- A canal should be established to allow the flow to continue to the natural creek channel along the toe of the slope of the hillside to the west.
- Reflector delineators and or a guardrail should be installed for safety to delineate the travel way.
- The cracks in the concrete structure need to be cleaned out and evaluated by a bridge engineer.
- The cracks should be sealed in order to protect the inner core of the bridge from water and plant intrusion.

Brown's Canyon Sediment Disposal Site

- The debris basin needs to be cleaned and prepared for the additional debris flows possible this year as a result of the fire in the canyons tributary to the basin.
- The concrete spillway needs to be repaired to prevent further erosion and damage to the facility.
- This will require removal of debris and the broken portion of the spillway.
- The running perennial creek should then be rerouted to run over the spillway again.
- The hiking trails leading into the basin need to be evaluated for slope stability in the locations of the burned retaining structures.
- Simple fixes like bulkhead style retaining walls or pipe and board can replace the burned structures.
- Hand rails should be provided in locations with steep slope drops along the trails.

References – See attached Engineering Report

Wildlife

I. Resource Condition Assessment

A. Resource Setting

The area burned by the Sesnon Fires contains habitat for several Federal and State listed endangered or threatened species, state species of special concern, and many common wildlife species (see Figure 10).

II. Findings of the On-The-Ground Survey

Many wildlife species, including endangered species, have been significantly impacted by the fires, but most of the native wildlife in the area (including the endangered species) has evolved to live in a fire-adapted ecosystem and over time they are likely to recover.

III. Emergency Determination

Emergency actions are not recommended for wildlife habitat and species recovery at this time, but recommendations have been made for treatments and monitoring that may be conducted to improve endangered species habitat and to document the effects of the fires on wildlife.

IV. Treatments to Mitigate the Emergency

- Habitat restoration
- Population surveys and monitoring
- Coordinate with local wildlife experts/agencies on treatments

Treatment Objective

- The treatments objectives are to monitor wildlife populations effected by the fire to identify potential decline in populations and encourage adaptive management.

Treatment Description

- Survey and monitor impacted wildlife populations
- Restore native habitats when and where appropriate

V. References – See attached Wildlife Technical Report

Botany

I. Resource Condition Assessment

A. Resource Setting

The 14,703 acre Sesnon Fire started on October 13, 2008 and was fully contained on October 18, 2008. The burn area is located in both the Santa Susana Mountains and Simi Hills, which are part of the east-west trending transverse ranges in southern California. Burn area elevations span from 3,747 feet at Oat Mountain Peak, to around 1,000 feet in the Santa Susana Pass State Historic Park.

The Sesnon Fire burned 23 separate vegetation types (Table 1, see Figure 11) on a combination of Federal, State, County, and private lands in Los Angeles and Ventura Counties from the Simi Hills in the south, to the southern edge of the Santa Clara valley. These 23 vegetation types represent 5 major categories: shrubland (67% of the area within the fire perimeter), hardwood forest/woodland (12%), conifer forest/woodland (<1%), grassland (14%), and Urban/Bare Rock (7%) (Appendix A). This report will focus on impacts to vegetation and rare, threatened, and endangered plant species on State Responsibility Lands (State, County, local, and Private ownership), which account for approximately 14,703 burned acres, as well as additional areas impacted outside the fire perimeter on State Responsibility Lands (acreage unknown). Botanical values at risk from contingency dozer lines constructed outside the actual burn perimeter on State Responsibility Lands are also included in this report.

II. Findings of the On-The-Ground Survey

A. Identify Values At Risk

Thirteen rare plant species and seven sensitive plant communities have been reported to occur in the region of the Sesnon Fire area, although six of them are not known from State Responsibility Lands (Table 2). Listed and rare plant species within the fire disturbance perimeter include Plummers' mariposa lily, San Fernando Valley spineflower, Santa Susana tarplant, slender-horned spineflower, Palmer's grapplinghook, Davidson's bush mallow, and California orcutt grass. Sensitive vegetation communities within the fire disturbance perimeter include California walnut woodland, vernal pool, southern coast live oak riparian forest, southern cottonwood willow riparian forest, southern mixed riparian forest, southern sycamore alder riparian woodland, and valley oak woodland.

B. Condition of Values At Risk

Rare plants and natural communities should recover from the fires naturally. Human activities post-fire, present the greatest potential threat due to the potential for damaging

rare plants, inhibiting native plant regeneration, introducing invasive weeds, and type conversion of shrublands and oak woodlands to non-native annual grassland dominant systems due to increase fire activity.

III. Emergency Determination

Emergencies to botanical resources related to the Sesnon Fire fall into three major categories: 1) threats to rare plants from the fire itself and from post-fire treatments implemented to protect other values, 2) loss of natural community integrity due to invasive weeds and potential post-fire treatments that inhibit natives, and 3) spread of Sudden Oak Death to uninfected areas.

IV. Treatments to Mitigate the Emergency

Treatment Types (including monitoring if applicable)

- Minimizing intervention and disturbance
- Restoration of endangered species habitat
- Dozer line remediation
- Invasive weed detection surveys
- Weed control
- Monitoring native vegetation recovery
- Pro-activity surveys
- Limiting public access to burned areas until vegetation can recover
- Limiting grazing on burned lands until vegetation can recover

Treatment Objectives

The treatment objectives are to protect rare plants and rare natural communities from human-caused disturbance, to promote native plant re-colonization of burned areas and dozer lines, to curtail invasive weed infestations in their incipient stages, and to avoid spreading invasive weeds into currently unoccupied areas.

Treatment Descriptions

Recommended treatments to mitigate the emergency include pre-activity surveys prior to ground disturbance in known rare plant habitat, avoidance of seeding and mulching, and weed surveys in key areas and prompt weed control.

Treatment Cost

Costs will not be incurred if seeding, mulching, and similar measures are avoided as recommended.

Discussion/Summary/Recommendations

The greatest threat to rare plants and natural communities from the Sesnon Fire is related to human-caused disturbance post-fire. Disturbance of rare plant habitat should be minimized if it cannot be avoided. Seeding and mulching are discouraged because they may inhibit natural recolonization of native species and introduce weeds. Additional measures are recommended to avoid the expansion of existing weed populations and

ensuring native vegetation recovery in areas that experienced frequent successive and/or high intensity burns.

V. References – See attached Botany Technical Report

Marine Resources/Fisheries

I. Resource Condition Assessment

A. Resource Setting

The 14,703 acre Sesnon Fire burned portions of Federal, State, City and private lands in October of 2008. Headwater portions of the Los Angeles River and smaller Calleguas Creek burned. This report focuses on marine and fishery resources affected by the fire. The fire directly affected no fish habitat, and the area has no potential habitat for native or non-native fish species, as there is very little water in the burned area. However, potential sedimentation issues may arise for downstream habitat and communities after precipitation events. Downstream movement of sediment may ultimately affect lagoon and coastal areas associated with the two watersheds. The State Emergency Assessment Team (SEAT) was tasked with identifying potential Values at Risk including people, homes, businesses, infrastructure, and natural resources.

Areas evaluated were in the Santa Susana Mountains in Ventura and Los Angeles Counties. Surveyed areas were within burned portions of Devil Canyon, Brown's Canyon, Limekiln Canyon and Aliso Canyon, which are tributaries to the Los Angeles River. Las Llajas Canyon and Chivo Canyon were inspected and are tributary to Arroyo Simi, which is tributary to Calleguas Creek, ultimately feeding Mugu Lagoon on the coast, South of Oxnard.

B. Survey Methods

Primary tributaries within the burn were surveyed for potential risk to fishery and marine resources. Initial reviews of natural resources potentially impacted were made using the California Natural Diversity Database (CNDDB). Fire severity, watershed, vegetation type and burned area reflectance maps provided by CAL FIRE were also helpful in evaluating potentially affected resources. Several sites in each of the canyons associated with these primary tributaries were selected for on-site inspections. Access was gained using either county or fire roads which connect the lower and upper portions of the canyons. Sites along dry creek beds allowed for close observations, and ridge roads allowed for greater views of watersheds and burn areas. While making field observations, notes and digital photographs were taken and catalogued, and Global Positioning System (GPS) waypoints were recorded.

C. Resource Condition after Fire

An increase in erosion is expected after a fire. Since protective vegetation has burned, rain from post-burn storms falls directly on exposed soils, carrying away loose sediments. Dead vegetation may also increase erosion potential due to plants loosing root systems causing soil instability. Cattle grazing practices may be leading to an increase in down slope movement of material as well. Cattle trails expose loose materials to the erosive forces of wind and water, further increasing erosive potential.

Soils in the Santa Susana mountain range have great erosion potential, where naturally highly erosive materials are prevalent. These highly erosive materials are common within this mountain range and each affected watershed (see soils section).

II. Recommendations

The remaining unburned areas in or around the Sesnon Fire should be protected and preserved specifically for wildlife habitat. Existing riparian habitat will be critical to animals. This remaining habitat is also important for rehabilitation of the burn zone as it will be a plant source allowing for re-colonization of native plants.

Burned areas should be monitored until significant re-growth has occurred. Severely burned areas should be protected from recreation use. Cattle grazing and recreational activities such as hiking and mountain biking will increase erosion. Due to the extremely erosive nature of existing soils, even small amounts of human use can be very harmful given the post burn fragility of the area. Foot activity should be limited to protect and increase the likelihood and speed of plant colonization.

Management should focus on upstream rehabilitation to minimize down stream movement of sediments. Native plants can be placed in burned riparian areas to help reestablish critical wildlife habitat. Planting native vegetation will also help in creating soil stability, eventually reducing erosion potential and rehabilitating hillsides. Post-fire surveys as well as long-term assessments should be considered to insure rehabilitation efforts are effective and native plant and animal communities return successfully. Similar surveys and long term monitoring should occur in lower portions of the watershed and estuaries to help mitigate disturbance created by increased sediment and pollutants.

III. References – See attached Fisheries Technical Report

Cultural Resources

I. Resource Condition Assessment

A. Resource Setting

The Sesnon fire burned the Santa Susana Range's Oat Mountains in terrain dominated by steep (up to 60°), southwest to southeast trending slopes incised by Las Llajas canyon to the west, Devil and Brown's canyons through the middle and Limekiln and Aliso Canyons to the east. The area encompasses Rocky Peak, Stony Point and Mission Point, with elevations ranging from approximately 1,100 to 3,400 feet. Geologic formations comprising the burn area include Modelo, Chatsworth, Saugus and Towsley conglomerate sandstone containing shale, quartzite, porphyry and granitic inclusions (Yerkes and Campbell 2005). Soils are well drained, sandstone residuum sandy and clayey loams (Web Soil Survey) supporting chamise (*Adenostoma fasiculatum*), manzanita (*Arctostaphylos sp.)*, sage (*Artemisia sp.)* and yucca (*Yucca sp*.), with oak (*Quercus agrifolia*), sumac (*Malosma laurina*), willow (*Salix sp.)* and sycamore (*Platanus racemosa*) occurring in sheltered canyon areas.

The Santa Susana Mountain region sustained a rich cultural history beginning approximately 8,000 years ago (Moratto 2004:79) when small, nomadic groups entered the region (Moratto 2004:76). These nomadic practices transitioned through time to more sedentary lifestyles, and by the time of contact the hunting-and-gathering Ventureño Chumash and Gabrieliñó/Tongva inhabited the Santa Susana region (Heizer 1978). The Santa Susana Mountains not only attracted seasonal forays from coastal Chumash peoples, but also supported year round habitation for inland groups (Moratto 2004:118). Spanish expeditions entered the Santa Susana region in the mid-1500s, and full European contact ensued in the late 1700s; missions were well established by the 1800s. Historic use of the Santa Susana's includes stagecoach lines, rail lines and ranching (Mealey et al. 2005:3). In addition to these typical uses, the Sesnon burn area encompasses oil fields, locations associated with Hollywood filmmaking and a Cold War Era Nike anti-aircraft missile defense site.

Prehistoric site types common to the Sesnon Fire area are comprised of habitation, rockshelter and encampment sites, lithic procurement and tool manufacture sites, milling locations, burials and rock art. Expected historic elements include ranching, drilling and habitation features. Rock art generally occurs in rockshelters and caves (Moratto 2004:119) located away from permanent settlements (Heizer 1978:519); the inland region's rock art is localized to the Simi Hills, Santa Monica Mountains, Sespe and Piru Creeks (Heizer 1978:519). Cultural materials indicative of this region include "doughnut" rocks, olivella beads, basketry (Heizer 1978), steatite bowls (Kroeber 1976:563), and clam shell disks utilized for monetary exchange (1976:564). Anticipated lithic materials include chert, quartzite, quartz and chalcedony.

B. Survey Methods

A "Do-It Yourself" archaeological records search conducted at the South Central Coast Information Center, California State University – Fullerton identified 49 sites within the Sesnon fire perimeter. The search was conducted for portions of Townships 2 and 3 North, Ranges 16 and 17 West on the Oat Mountain and Simi Valley East USGS Topographic Quadrangles.

Between October 31 and November 7, 2008, the Sesnon SEAT archaeologist conducted field evaluations for all known sites within the fire perimeter. Damage incurred during suppression efforts was evaluated during the incident. All site evaluation summaries will be submitted to the South Central Coast Information Center, California State University – Fullerton.

C. Resource Condition After Fire

Conditions on the Sesnon fire generated a primarily low to moderate intensity, short duration fire. Therefore, primary risks to cultural resources include damage to rockshelters, rock art features, alteration of midden soil, consumption of organic historic features, erosion threats and increased site visibility. Furthermore, treatments identified by SEAT members introduce additional potential to impact cultural resources. Fires are common in this area recently and in historic times (see Figure 12).

II. Emergency Determination

Identified Values at Risk include potential damage to cultural resources from exfoliation of sandstone surfaces, site erosion from increased surface water runoff, increased visitor impacts due to heightened visibility and fire-consumed historic elements. Post-fire impact evaluations revealed the Sesnon fire generally did not reach conditions causing adverse affects to sandstone formations, that potential for erosion loss is no greater than before the fire, and that most sites are in areas already impacted by visitors. One historic resource (Site "Brown's Canyon Timber Bridge") was severely damaged in the fire and may be removed.

III. Treatments to Mitigate the Emergency

Inventory, monitoring, covering, signing, check dams, armoring, bracing, and removing hazards.

IV. Discussion/Summary/Recommendations:

1. The Brown's Canyon Timber Bridge should have full scale HABS/HAER documentation prior to replacement;

2. Full site documentation should be completed on the Nike Site;

3. Archaeological review shall occur prior to any additional rehabilitation or new construction efforts affiliated with recommended mitigation measures;

4. Native American consultation should be initiated prior to implementation of recommended mitigation measures, and if deemed necessary a Native American monitor will be present during undertaking;

5. No cultural concerns were identified in association with the Sulphur Springs Guzzler improvement, the Brown's Canyon Concrete Bridge and Debris Flow or the Brown's Canyon Sediment Disposal Site.

Treatment Objective:

Lessen or mitigate potential impacts to cultural resources.

Treatment Description:

Each treatment aims at reducing the potential adverse impacts to the cultural resource.

DRAFT TECHNICAL SPECIALIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

Resource: Geology

Fire Name: SESNON FIRE CA-LAC-08231953 November 2008

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I. Resource Condition Assessment

A. Resource Setting

The 14,703-acre Sesnon fire burn area is underlain by alluvial units in the San Fernando Valley within the Northridge Hills and on the south flank of the Santa Susana Mountains. The Saugus Formation, a Plio-Pleistocene alluvial unit, makes up much of the south flank of the Santa Susana Mountains and is exposed in the core of anticlinal hills along the Northridge Hills uplift. Bedding in the area is generally along the northern limb of the anticline and appears to dip to the north an average of approximately 30 degrees. This reduces the likelihood of major bedrock landslides in southern facing slopes. Overlying Saugus Formation in the Northridge Hills are very old alluvial deposits. These deposits are uplifted, deformed, have red (old) soils and are typically dense to very dense. The older unit is predominantly silt and clay and shows no trace of its original depositional geomorphology. The younger unit, although similarly uplifted, appears to be part of an alluvial fan that extended over the Northridge Hills before uplift cut it off from its source.

Overlying very old alluvial deposits in the Northridge Hills are deposits that formed as alluvial fans from the Santa Susana Mountains. These deposits are composed of sand, silt, and gravel and form recognizable alluvial fans. The fan surfaces are no longer active because continuing deformation has either elevated them above the area of deposition or because they have been buried by later alluvium. Older alluvium is distinguished from younger alluvium by being uplifted and usually incised by younger drainage courses and by having relatively even tonal patterns on pre-development aerial photographs. Younger alluvium, in contrast, typically has a braided stream tonal pattern even when those stream channels have no geomorphic expression. Small alluvial fans occur along the south side of the Santa Susana Mountains. Along the southern front of the Santa Susana Mountains, all major streams are incised into the surface. At the Northridge Hills, the largest stream, Limekiln Wash, has incised completely through the hills, leaving remnant surfaces as terraces. Smaller drainage courses, especially Wilbur Wash and Aliso Wash, have apparently been blocked by the Northridge Hills, causing deposition of younger alluvium on top. The surface re-emerges from beneath these younger sediments in the Northridge Hills. It is warped over the hills and buried by younger sediments again on the south side.

The streams that cross the Northridge Hills, as well as others from the south and west, have built alluvial fans into the main San Fernando Valley basin south of the hills. These alluvial fans can be subdivided into young and active fan deposits on the basis of geomorphology.

Topography within the burn area ranges from gentle to very steep, with elevations ranging from about 1000 ft above mean sea level in Chatsworth and in Granada Hills along the southern margin of the fire to about 3,500 feet at the northern limit where the fire burned up the slopes to the ridgeline north of Chatsworth and Granada Hills. Burned slopes drain into numerous primarily southern flowing watercourses discharging to the Los Angeles River and Calleguas Creek watersheds.

B. Survey Methods

To evaluate the risk to life and property, field reconnaissance was conducted from October 29 through November 5, 2008. The entire burn was inspected to identify where high-value sites may be present, concentrating on developed residential areas. Road and foot inspections were conducted in areas with high value sites. Rural areas where no houses, businesses, or other high-value risks were identified, were viewed from a distance but not specifically surveyed on the ground. Evaluations of road-related features, such as culverts and bridges, are addressed in the Engineering Section.

II. Findings of the On-The-Ground Survey (Observations)

A. Identify Values at Risk (Post-Fire)

Values at risk are: possible loss of life and property due to in-channel floods, hyperconcentrated floods, debris torrents, debris flows, slope-generated landslides, rock fall, and associated slope movement.

1. Describe Observations

The principal concern with the Sesnon Fire is an increase in the potential for in-channel floods, hyperconcentrated floods, debris torrents, and debris flows. Primary mechanisms for this are the loss of mechanical support of hillslope materials provided by vegetation and vegetative litter and the increase in runoff resulting from reductions in interception and infiltration, from the simplification of surficial runoff patterns, and from the loss of mechanical support along stream channels where riparian vegetation was burned. Where fires burn hot, primarily in the upper reaches between Browns Canyon and Mormon Canyon (see FIRE SEVERITY MAP, Figure 5), the reduction in interception may be affected by development of hydrophobic soils where waxy substances released by plant materials follow thermal gradients into the soil and congeal as continuous surfaces. The magnitude of post-fire damage will be determined by the intensity and duration of storms impacting the area.

2. Specific Observations

Thirty seven (37) locations were surveyed on the ground to assess potential risks to lives or property and are listed and briefly described below and summarized in Appendix (1) "California Geological Survey Burn Site Evaluation Summary" to this report. The locations of sites are shown on Figure 7 (waypoints overview). Of the 37 locations surveyed, only three (Nos. 117, 118, and 129), were determined to represent a high risk to life and/or property. The greatest immediate threat to life, Browns Canyon Road Bridge (location 117), is discussed in the Engineering Technical Report. Five other locations (Nos. 104, 130, 131, 132, and 137) were determined to represent moderate threats to life and/or property.

III. Emergency Determination

Values at risk considered in this assessment include possible loss of life and property due to landsliding, debris flow, rock fall, debris torrents, and flooding from increased surface water runoff. In general, risks from landslides, debris flows and rock falls are possible where roads, residences or other development are located within and/or adjacent to canyon stream channels or on alluvial fans, colluvial footslopes and debris flow deposits.

It should be noted that these hazards are part of the natural processes in this environment, and that these risks were present under pre-fire conditions. Many existing structures in the burn area have been and will continue to be at risk from these hazards. The potential for these processes to be exacerbated by fire is primarily dependent upon burn severity and slope steepness, both of which are highly variable. In general, areas where burn severity is moderately high, slopes are steep, and the potential for increased hazard is greatest, are located in the sparsely populated upper reaches between Browns Canyon and Mormon Canyon, where very little urban development has occurred. Burn severity was generally low to moderate in the remaining areas of the Sesnon fire (See Figure 5, "Fire Severity Map". Risks to cultural, soils and biologic assets are covered in other specialist reports. Areas with moderate to high potential risks to life and property from slope instabilities exist elsewhere in the vicinity of the Sesnon fire, but assessment of sites that were not affected by the fire is beyond the scope of this evaluation.

IV. Recommendations

A. General Recommendations:

1. Site-specific observations included with this review should be considered in any emergency response plan developed by emergency agencies.
2. Existing road drainage systems should be inspected by the appropriate controlling agency to evaluate potential impacts from floods, hyperconcentrated floods, debris torrents, debris flows and sedimentation resulting from winter rains.

3. Responsible parties should be made aware of the potential hazard to lives and property in and downstream from the fire area, especially those communities located downstream of Browns Canyon, Aliso Canyon, Limekiln Canyon, and Las Llajas Canyon.
4. Campgrounds and hiking trails should be signed and closed as needed by the responsible agencies and/or private organizations to protect campers and hikers.

B. Specific Recommendations:

1. The sites identified in Appendix 1 – CA Geological Survey Burn Site Evaluation Summary should be evaluated by Professional Geologists or Professional Engineers with experience in slope stability and debris flow hazard identification and mitigation to fully document the scope of problems at each site.

V. References

"The Geology of the Upper Las Llajas Canyon Area, Santa Susana Mountains, CA," William D. Lewis, 1940

Appendix (1)

California Geological Survey Burn Site Evaluation Summary
Fire Name : SESNON
Bold where risks are high

Site number	At-risk Feature	Street Address	GPS location Latitude N	GPS location Longitude W	Hazard	Likeli-hood	Risk to lives fire	Risk to lives pre-exist	Risk to property fire	Risk to property pre-exist
101	Debris Basin	Adjacent to 17228 Sesnon Blvd.	34.30983	118.50825	Debris Flow	Low	Low	Low	Low	Low
102	Cattle Guzzler	Approx. 200 ft from entrance to Bee Canyon Road	34.30586	118.51971	Water leak from unidentified source running across/along side dirt road	Mod	Low	None	Low	Low
103	Road	Bee Canyon Road	34.30767	118.52389	Debris flow/Flood	Mod	Low	Low	Low	Low
104	Debris Basin	Near 12863 Neon Way	34.30435	118.51729	Debris flow/Flood	Low	Mod	Low	Low	Low
105	Home	12819 Tuscan Drive	34.30286	118.52114	Debris flow/Flood	Low	Low	Low	Low	Low
106	Home	12955 Tuscan Drive	34.30284	118.52469	Debris flow/Flood	Low	Low	Low	Low	Low
107	Homes	12970, 13000 Tuscan Drive	34.30209	118.52592	Debris flow/Flood	Low	Low	Low	Low	Low
108	Home	17943 Lone Oak	34.30086	118.52712	Debris flow/Flood	Low	Low	Low	Low	Low
109	Culvert	Sesnon Blvd	34.29838	118.52904	Plugging/Flood	Mod	Low	Low	Low	Low
110	Culvert	Aliso Canyon at Rinaldi and Hesperia	34.29857	118.53706	Plugging/Flood	Mod	Low	Low	Low	Low
111	Culvert	Sesnon Blvd at Tampa Av.	34.29607	118.55152	Plugging/Flood	Mod	Low	Low	Low	Low

112	C. Basin/ Culvert	Holleigh Brenson Memorial Park, Sesnon Bl.	34.29422	118.56976	Debris flow/Flood	Low	Low	Low	Low	Low
113	Outlet	Holleigh Brenson Memorial Park, Sesnon Bl.	34.29243	118.56922	Flood	High	Low	Low	Low	Low
114	Catch Basin	20271 Via Urbino	34.29957	118.57487	Debris flow/Flood	Mod	Low	Low	Low	Low
115	Catch Basin	Via Urbino	34.29978	118.57594	Debris flow/Flood	Low	Low	Low	Low	Low
116	Catch Basin	Via Urbino	34.29965	118.57488	Debris flow/Flood	Low	Low	Low	Low	Low
117	**Bridge**	**Brown Canyon Road**	**34.28485**	**118.59145**	**Sructural Failure**	**High**	**High**	**Low**	**High**	**Low**
118	**Road**	**Brown Canyon Road**	**34.28206**	**118.59089**	**Debris flow/Flood**	**Mod**	**Low**	**Low**	**High**	**Mod**
119	Debris Basin	Brown Canyon Debris Basin at Hwy 118	34.27541	118.59205	Debris flow/Flood	Low	Low	Low	Low	Low
120	Catch Basin	Peak Rd and Taima Rd., Indian Falls Estate	34.28344	118.62128	Debris flow/Flood	Low	Low	Low	Low	Low
121	Culvert	East of Topanga Canyon Road near Tunnel 28	34.27227	118.60235	Plugging/Flood	Mod	Low	Low	Low	Low
122	Home		34.29839	118.67673	Debris flow/Flood	Low	Low	Low	Low	Low
123	Outlet		34.29836	118.67719	Debris flow/Flood	Low	Low	Low	Low	Low
124	Outlet		34.29840	118.67713	Debris flow/Flood	Low	Low	Low	Low	Low
125	Catch Basin		34.29856	118.67774	Debris flow/Flood	Low	Low	Low	Low	Low
126	Drop Inlet	Tunnel 28 East Portal at Topanga Canyon Rd.	34.27223	118.60367	Plugging/Flood	Low	Low	Low	Low	Low

127	Culvert	Topanga Canyon Road near Tunnel 28	34.27267	118.60438	Debris flow/Flood	Low	Low	Low	Low	Low
128	Culvert	Santa Susana Pass Historical Park	34.27135	118.61130	Debris Flow	Low	Low	Low	Low	Low
129	**Catch Basin**	**Mile Post 442.8 between Tunnel 26 and 27 (u/s)**	**34.26398**	**118.61912**	**Plugged Riser/Flood**	**High**	**Low**	**High**	**High**	**High**
130	Culvert Outlet	Mile Post 442.8 between Tunnel 26 and 27 (d/s)	34.26322	118.61920	Flood	Low	Low	Low	Mod	Mod
131	Home	19033 Kilfinan St	34.29741	118.54878	Debris flow/Flood	Mod	Mod	Low	Mod	Low
132	Catch Basin	Adjacent to 19033 Kilfinan st	34.29710	118.54888	Debris flow/Flood	Mod	Low	Low	Mod	Low
133	Limekiln D. Basin	Tampa Av/Tunney Road	34.26069	118.55865	Debris Flow	Low	Low	Low	Low	Low
134	Aliso Cyn D. Basin	Newcastle/ San Fernando Mission Road	34.27592	118.52763	Debris Flow	Low	Low	Low	Low	Low
135	Debris Basin	Las Llahas Canon Debris Basin, Yosemite Av.	34.31806	118.62778	Debris flow/Flood	Low	Low	Low	Low	Low
136	Culvert	Brown Canyon Road	34.3274333	118.588583	Debris flow/Flood	Low	Low	Low	Low	Low
137	Culvert	Brown Canyon Road	34.30587	118.60031	Plugged culvert	High	Low	High	Mod	High

DRAFT TECHNICAL SPECIALIST'S
STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

Resource: Hydrology

Fire Name: SESNON FIRE CA-LAC-08231954 November 2008

Author Name: Wenhua Yu, Engineer Water Resources
California Department of Water Resource
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I.Resource Condition Assessment

A. Resource Setting

The Sesnon Fire burned 14,703 acres in Los Angeles and Ventura Counties. The burn area covers that part of Santa Susana Mountains north of San Fernando Valley and Simi Valley. Topography consists of mild to very-steep slopes, ranging from more than 3400 feet above mean sea level, along the Oat Mountain ridgeline in the north, to an elevation of approximately 1000 feet along 118 Freeway in the south. The 50-year 24-hour rainfall intensity ranges from 11 to 12.5 inches.

The burn area falls into Southern California Coastal sub-region (USGS HUC 1807), and Ventura-San Gabriel Coastal basin (USGS HUC 180701). The Sesnon fire burned portions of the following three HUC-8 hydrologic units.

HUC	HUC-8	18070105	18070103	18070102
	HUC-Name	LOS_ANGELES	CALLEGUAS	SANTA_CLARA
	Acres	41142	184398	291832
	Acres Burned			
	HSANAME	Bull Canyon	Simi Valley	Eastern
	HANAME	San Fernando	Calleguas-Conejo	Upper Santa Clara
	HUNAME	LOS ANGELES RIVER	CALLEGUAS	SANTA CLARA - CALLEGUAS
	HBPANAME	Los Angeles	Los Angeles	Los Angeles
	RBNAME	Los Angeles	Los Angeles	Los Angeles
	HRNAME	South Coast	South Coast	South Coast
DWR Names	DWRNUM20	4412.210000	4408.270000	4403.510000
	DWRHUNAME	LOS ANGELES RIVER	CALLEGUAS	SANTA CLARA - CALLEGUAS
	DWRHANAME	San Fernando	Calleguas-	Upper Santa

			Conejo	Clara
	DWRHSANAME	Bull Canyon	Simi Valley	Eastern

These three watersheds were subdivided into 8 uniquely named sub-watersheds for reference; each of them represents a separate drainage. More than 80 percent of the burn is within the Bull Canyon hydrologic sub-area. A number of creeks originate from the upper portion of the Santa Susana Mountains, flow into the urban area of San Fernando Valley in the south, and empty into the Los Angeles River. From west to east, they are the Santa Susana Pass Creek, Browns Canyon, Limekiln Canyon, Aliso Canyon, and Bull Creek.

Similarly, the burn in Simi Valley hydrologic sub-area was divided into two sub-watersheds: Las Llajas Canyon and Hummingbird Canyon, both of these are tributary to Arroyo Simi, and eventually join Calleguas Creek.

Only a very small portion of the burn area spreads cross the ridgeline of Santa Susana Mountains, which is the boundary between the Santa Clara and Los Angeles River watersheds. The Santa Clara River watershed burn consists of a number of small patches distributed along the ridgeline more than 8 miles long from east to west. Collectively they were referenced as Santa Clara sub-watershed in this report.

These sub-watersheds are delineated as shown (see Figure 3)

B. Survey Method

Field surveys were conducted on October 29 through November 5, 2008, evaluating fire effects and associated activities to the watershed and adjoining areas. Team members worked in groups according to field safety regulations.

Survey walks were conducted from roadside locations to accessible areas of concern; GPS points were taken and recorded on maps with corresponding photographs and field notes. Team members confirmed the Soil Burn Severity Map by periodically performing soil hydrophobicity tests. For accuracy, team members consulted field/map/resource issues as they presented in the landscape.

One-hundred thirty-eight sites were identified during the field survey: they are listed in table-1, and displayed on the map(see Figure 7). Each site was assigned a Site ID. Values at risk and risk to human life and property were identified.

II.Findings of the On-The-Ground Survey

Generally, roads, railways, tunnels, debris catch basins and culverts in the burned area were not directly impacted by fire. A timber bridge was burned, and its structural integrity appears compromised, posing high risk to vehicles and passengers traveling on

it, requiring immediate action. At a few locations, roadside guardrails were damaged by fire and need repairs

The provided Burned Area Reflectance Classification (BARC) map had a highly accurate perimeter (see Figure 5). Field verification revealed some areas marked high burn severity were actually low to moderate. Overall, the conditions in the field, agree with the BARC map. The burn severity map was updated to match field findings (see Figure 5).

Following are the findings in each sub-watershed.

Las Llajas Canyon sub-watershed:

> Total sub-watershed size: 6865 acres, 2401 acres within the fire perimeter, 19 acres of high burn severity, 112 acres of moderate burn severity, 247 acres of low burn severity, 2024 acres unburned within the fire perimeter. This sub-watershed is located at the northwest part of the Sesnon fire, consisting of steep slopes along Canyons, such as Las Llajas Canyon, and Sulpher Canyon. Steep slopes and loose soil here cause erosion and sediment in run-off during ordinary rain events even without the fire. Chaparral, sagebrush, grass, and trees (oaks and others) in the lower portion generally cover the area. The fire reduced vegetation cover, increasing soil hydrophobicity, and potentially run-off and sedimentation down-stream. Run-off will flow to Las Llajas catch basin (Site 135). The catch basin has a sediment capacity of at least 400,000 cubic yards, and is very well maintained, and the sediment in the debris basin was cleaned up in previous years, and now the full capacity of the catch basin is available to handle future rain events
> .
> Potential problems here include a dozer line cut on hills behind homes at Sites 122, 123, 124 and 125. The dozer exposed loose soils on steep slopes less than 100 yards from the backyard of homes. Catch basins behind the homes were designed to collect run-off and sediment; however, they may not handle excessive amounts of sediment and mudflow. These sediment catch basins should be cleaned up and monitored regularly. A new sediment barrier should be constructed providing more protection against possible mudslides.

Hummingbird sub-watershed:

> Total sub-watershed size: 2324 acres, 370 acres within the fire perimeter, 0 acres of high burn severity, 1 acre of moderate burn severity, 65 acres of low burn severity, 304 acres unburned within the fire perimeter.
>
> This sub-watershed is in the southeast of the Las Llajas Canyon sub-watershed. Hummingbird creek is a small stream flowing into Simi Arroyo. Elevations range from 2700 feet in the north to 1200 feet in the south. Vegetation is mostly Chaparral and Sage Brush. Burn severity is mostly low, with no identified sites at risk.

Santa Susana Pass sub-watershed:

Total sub-watershed size: 1605 acres, 443 acres within the fire perimeter, 0 acres of high burn severity, 103 acres of moderate burn severity, 199 acres of low burn severity, 141 acres unburned within the fire perimeter.

This sub-watershed is in the east of Hummingbird sub-watershed and on the west of Browns Canyon sub-watershed, It Consisting of small hills ranging in elevation from 2400 to 1000 feet. This sub-watershed drains southerly to Los Angeles River. MTA railway tracks run across this area from east to west, and there are several tunnels south of the 118 Freeway. Burn severity is typically low to moderate, with no direct fire damage to railway tracks and tunnels; however, there are sites at risk. The culvert between MTA tunnel 26 and 27 (Site 129) is fully clogged with sediment and identified as high risk to property. Sediment must be removed to restore function and accommodate excessive run-off. The culvert on the north of railway track (Site 127) is partially clogged and should be cleared. Chatsworth Recreation Center in Chatsworth Park is downstream. With heavy rain, it may subject to excessive run-off and debris flow. Evacuation is recommended for large rainstorm events.

Browns Canyon sub-watershed:

Total sub-watershed size: 11264 acres, 8012 acres within the fire perimeter, 31 acres of high burn severity, 6904 acres of moderate burn severity, 992 acres of low burn severity, 838 acres unburned within the fire perimeter.

This sub-watershed extends from central Santa Susana Mountains in the north to San Fernando Valley to the south. It extends 4 miles from east to west, and 4 miles north to east. Its north edge is located on Oat Mountain, with an elevation of more than 3500 feet. In the south, it is adjacent to the communities of Porter Ranch and Chatsworth, with an elevation of 1000 feet. This sub-watershed consists of rugged, steep to moderate slope canyons in its northern portion. Major canyons include Browns Canyon, Ybarra Canyon, Mormons Canyon, Devil Canyon and Blind Canyon. Brown Creek begins at Oat Mountain running north to south; and Devil Canyon begins at the northwest edge and runs southeast. Devil creek joins Browns creek and exits the burn area at the Sediment Disposal Site (Site 119).

This is the largest sub-watershed with the highest burn severity. High burn severity occurred on upper reaches between Mormon and Browns Canyon. Fire reduced vegetation cover here, and increased soil hydrophobicity; this will result in increased run-off and sedimentation. Most parts of this sub-watershed are open wild spaces; no specific values at risk were identified. Homes exist at the south edge in the communities of Porter Ranch and Chatsworth. Generally, the homes built down slope may expect higher risk of flood and debris flow; homes built near the top of slope may be subject to high-risk landslides from erosion.

Values at risk include a damaged timber bridge on Browns Canyon Rd (Site 117), a clogged culvert (Site 136 and 137), and sections of road subject to debris flow or landslide (such as Site 117). This area has high risk of landslide and debris flow even without the fire; however, fire exacerbates the problem.

Limekiln Creek sub-watershed:

Total sub-watershed size: 6345 acres, 1709 acres within fire perimeter, 24 acres of high burn severity, 758 acres of moderate burn severity, 819 acres of low burn severity, 125 acres unburned within fire perimeter.

This sub-watershed covers the area from Oat Mountain to Porter Ranch. Limekiln canyon consists of steep mountain slopes in the north, with Limekiln creek running north to south, reaching a debris basin at Site 133. This area generally has low to moderate burn severity. Its northern part is mostly open space with a few industrial plants, and no identified high-risk values. The southern part is adjacent to Porter Ranch where the survey focused on threats to homes. Homes down slope would expect higher than normal run-off, possible debris flow and mud slides. Generally, debris catch basins and concrete V-ditches were constructed protecting homes by diverting run-off and retaining sediment. This community is relative new, with catch basins and culverts in satisfactory conditions. The homes were identified having low risk from flooding and debris flow. There are a number of culverts partially or fully clogged (Site 109 and 112), this would cause flooding in rain events. These culverts should be cleared and monitored during rain. The lower reach of Limekiln Creak between Sesnon Blvd and 118 Freeway has a large capacity. Homes on the top of slope at the western edge of Limekiln Canyon have the risk of landslide; however, this is pre-existing condition. Burn severity in the area is typically low. The Limekiln Debris Basin (Site 133) is designed to retain sediment and debris, and it is well maintained. It was identified as low risk.

Aliso Creek sub-watershed:

Total sub-watershed size: 1803 acres, 1400 acres within fire perimeter, 5 acres of high burn severity, 755 acres of moderate burn severity, 499 acres of low burn severity, 141 acres unburned within fire perimeter.

The major Canyon in this sub-watershed consists of very steep to moderate slopes with pre-existing high risk of land slide and debris flow even before the fire; however, the canyon has very large capacity to carry run-off and sediment. Aliso Creek flows south towards the 118 freeway reaching Aliso Debris Basin (Site 134). The basin functions to retain up stream sediment, and releases run-off into a

concrete channel that eventually discharges into the Los Angeles River in the south. The Aliso Debris Basin is very well maintained, providing large capacity to catch sediments and debris from this sub-watershed. It is low risk.

Between Sesnon Blvd and 118 Freeway, on the east and west sides of Aliso Canyon, many homes are built on top of the slope, but these slopes are identified as low landslide risk on Land Slide Map.

Bull Creek sub-watershed:

Total sub-watershed size: 2513 acres, 232 acres within fire perimeter, 10 acres of high burn severity, 72 acres of moderate burn severity, 57 acres of low burn severity, 232 acres unburned within fire perimeter.

This sub-watershed is on the east edge of the burn, consisting of gentle to moderate slopes. However, it is adjacent to urban areas in Granada Hills. The burned is upstream of many homes. Although the size of burn areas are small, burn severity ranges from moderate to high. The identified value at risk is a home next to a catch basin (Site 104). In rain events, it would expect to receive increased run-off and possible debris flow. There are burned tree trunks before the catch basin that should be removed to prevent choking the culvert.

There are a number of localized drainage basins along the edge of the burn area. Run-off in these areas drains downstream to the main canyon through several low risk debris catch basins.

Santa Clara River sub-watershed:

Total sub-watershed size: 3827 acres, 119 acres within fire perimeter, 6 acres of high burn severity, 14 acres of moderate burn severity, 36 acres of low burn severity, 13 acres unburned within fire perimeter.

The burn area in this sub-watershed is along the Oak Mountain ridgeline, which is the boundary between the Santa Clara and Los Angeles River watersheds. The burn consists of small patches and spans a distance of 8 miles from east to west. Burn severity is generally low to moderate, and is small compared to the whole watershed. No particular sites at risk were identified.

<u>Peak Flow Analyses</u>

Peak flow analyses were performed using the same methodology in the Hydrology Specialist Report for the Telegraph fire (2008). Post-fire flows were estimated based on the following assumptions:

Burned areas that have a high runoff response rating as a result of the fire (i.e. forested environments with high burn severity) will experience 5-fold increase in

the Q2 (or a flood with a recurrence interval of 2 years), a 3-fold increase in the Q5, and a 2-fold increase on the Q10.

Burned areas with a moderate runoff response rating as a result of the fire (i.e. forested environments with moderate burn severity) will experience 2.5-fold increase in the Q2, a 1.75-fold increase in the Q5, and a no increase on the Q10. Areas of low burn severity, rock, and unburned sections have a low runoff response and are assumed for these calculations not to experience increases in post-fire runoff.

It is assumed that runoff response classes are evenly distributed throughout the watershed. In addition, there is no channel routing or sediment bulking factor used in this analysis.

Table Hydrology-1 shows the acreage burned, acres on the whole watershed, unburned acres, acres of low severity burn, acres of moderate severity burn, and acres of high severity burn. These numbers were used to calculate values in Table Hydrology- 2.

Table Hydrology- 2 calculates the percent of pre-fire peak flow we are likely to see for each sub-watershed during the first winter for the following sizes of storms: a two-year return-interval storm (Q2), a five-year return interval storm (Q5), and a ten-year interval storm (Q10). For each of the flow-intervals, the percentage of increase was calculated by comparing to the whole sub-watershed area, and the area within the fire perimeter.

For example, the values for a Q2 flow in the Browns Canyon sub-watershed is 193% for whole area, and 230% for fire perimeter, this means the post-fire peak run-off is 1.93 folds of pre-fire peak run-off for the whole sub-watershed area, and the peak run-off for the area within fire perimeter is 2.3 folds of the pre-fire value.

Table Hydrology- 2 shows how the longer the return interval (or in other words the larger the size of the storm), the smaller the effect of the fire on increasing the peak flow resulting from that storm.

Table-1 Hydrology-1 Acres of sub-watershed burned and acres of severity.

Sub-watershed Name	Acres of Sub-watershed	Acres in Fire Perimeter	Acres Unburned in Fire Perimeter	Low Severity	Moderate Severity	High Severity
Las Llajas Creek	6865	2401	2024	247	112	19
Hummingbird Canyon	2324	370	304	65	1	0
Santa Susana Pass	1605	443	141	199	103	0
Browns Canyon	11264	8012	838	992	6904	31

Limekiln Canyon	6345	1709	125	819	758	24
Aliso Canyon	1803	1400	141	499	755	5
Bull Canyon	2513	232	57	72	93	10
Santa Clara River	3827	119	63	36	14	6

Table-2 Hydrology-2 Predicted 1st year post-fire peak flow percent changes for 2, 5, and 10 year events.

Sub-watershed Name	Peak flow Q2		Peak flow Q5		Peak flow Q10	
	Whole Area	Fire Perimeter	Whole Area	Fire Perimeter	Whole Area	Fire Perimeter
Las Llajas Creek	103.6%	110.2%	101.8%	105.1%	100.2%	100.8%
Hummingbird Canyon	100.1%	100.4%	100.0%	100.2%	100.0%	100.0%
Santa Susana Creek	109.6%	134.9%	104.8%	117.4%	100.0%	100.0%
Browns Canyon	193.0%	230.8%	146.5%	165.4%	100.3%	100.4%
Limekiln	119.4%	172.1%	109.7%	136.1%	100.4%	101.4%
Aliso Canyon	109.6%	134.9%	104.8%	117.4%	100.0%	100.0%
Bull Canyon	1.930%	230.8%	146.5%	165.4%	100.3%	100.4%
Santa Clara River	119.4%	172.1%	109.7%	136.1%	100.4%	101.4%

A. Identify Potential Values at Risk

Values at risk identified in the Sesnon fire assessment are loss of human life and property due to increases in potential in-channel floods, hyper-concentrated floods, debris torrents, and debris flows. Additionally, bridges, roads, railways, tunnels, culverts, and water supply infrastructures may be at risk to increased creek flows and potential clogging of culverts and drainage structures by debris. The watershed is the resource of concern in this report. Watershed threats include higher than normal flows with possible bulking/debris flow in rain events. The Risk for flooding and debris flow increases proportionally with rainfall intensity throughout the Sesnon Fire basins and adjacent areas.

III.Emergency Determination

There sites posing imminent threats to human life and properties, requiring immediate action to reduce their risk. The structure of the timber bridge on Brown's Canyon Road was severely damaged by fire, and needs to be closed and repaired immediately. The actual design/construction of the bridge needs to be done by professional engineers, and is beyond the scope of this report.

The result of the moderate to high burn severity in some areas within Sesnon Fire perimeter left high potential for large scale flooding and debris flow during light to moderate rainfall events. The possibility and likelihood of increased runoff and debris flow during rain events puts all resources at an increased risk. Generally, water resources, roads, trails, and bridges in the burned area were not directly impacted by fire and appear

to be in satisfactory condition; however, a number of culverts were not very well maintained, and were partially or completely plugged. This would cause flooding in impacted areas, and some roads within the burned areas are in danger of washout from flooding and jamming of culverts with debris flow. These culverts should be cleared before the coming rain season.

Fire may introduce excessive amounts of slope erosion at locations adjacent to homes and roads. Erosion control BMPs such as fiber rolls or seeding need to be implemented at critical locations.

IV.Treatments to mitigate the Emergency

Treatments for the burn area will be very difficult, impractical or unnecessary because of topography, sparseness of urban development and the fact that many of these symptoms were pre-existing, and the likelihood of rain in coming months.
The following items can be done to reduce impacts from the fire:

1. Remove burned trees hanging over roads where they may cause personal injury.
2. Remove burned woody debris at culvert inlets where they may cause clogging.
3. Clean and clear existing sediment and debris at culverts
4. Install fine sediment and large debris catchments above culverts.
5. Build concrete barriers or ditches to retain sediment behind certain homes subject to higher risk of debris flow and mud slide.
6. Assess and repair burned retaining walls, roadway guard rails, and bridges.
7. Stabilize slopes by implementing engineering practice or applying sediment control BMPs.

V.Discussion/Recommendations

Prepare for higher than normal flows with possible bulking/debris flow in all rain events. The risk for flooding and debris flow increases proportionally with rainfall intensity throughout the Sesnon Fire basins and adjacent areas.
Monitor debris flow and run-off, build warning systems, and collect data for verification of existing hydrology model and for building of new post-fire hydrology models.
Monitor all public and private roads and hiking trails for safety during rain events.
Clear and maintain all debris basins, culverts, and other sediment/run-off handling structures.
The responsible government agencies should develop and adhere to emergency response plans for heavy rain events.

VI.References

Hydrology Technical Specialist Report,
Telegraph Fire, CA-MMU-009779

Hydrology Manual, 2006
Los Angeles County Public Works
http://www.ladpw.org/wrd/publication/engineering/2006_Hydrology_Manual/2006%20Hydrology%20Manual-Divided.pdf

DRAFT TECHNICAL SPECIALIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

Resource: Water Quality

Fire Name: SESNON FIRE CA-LAC-08231953 November 2008

Author Name: J. Michael Lyons, Environmental Specialist
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

I. Resource Condition Assessment

A. Setting

The 14,703 acre Sesnon fire burned portions of Federal, State, City and private lands in October 2008. Headwater portions of the Simi Valley Watershed (designated as the Calleguas Creek Watershed by the Los Angeles Regional Water Quality Control Board (LARWQCB)), Bull Canyon Watershed (designated as the Los Angeles River Watershed by the LARWQCB) and Eastern Watershed (designated as the Santa Clara River Watershed by the LARWQCB) were burned (see Figure 1). This report focuses on potential adverse impacts to water quality and beneficial uses to surface and groundwater resources in areas affected directly or indirectly by the fire.

The limited studies conducted after previous fires (Stein, 2008) suggest that total runoff volume may increase by 25% and peak storm flow rates may increase five-fold following fires in Southern California (these values are approximate and can vary significantly depending on the severity of the fire, local topography, rainfall intensity, and other factors). Frequent wildfires can alter soil chemistry and stormwater characteristics, which can result in adverse effects to downstream water quality (including increases in pH). Increased storm flow and sediment runoff following fires have been associated with increases in loads of nutrients, metals, and certain organic pollutants (including dioxins) in local waterways. In addition, combustion of plants and natural materials release metals and nitrogen compounds that can be transported into waterways.

In addition to the direct effects of runoff from burned landscapes, materials associated with ash at the burn location can be carried away from fire areas in smoke and ash while the fire is burning and in ash residues after the fire has ended. Subsequent atmospheric deposition can markedly increase the quantity of various pollutants available to storm flows downwind of fires, which can result in adverse effects to water quality in waterbodies within the burn area and also in nearby unburned areas.

Bull Canyon Watershed

The Bull Canyon Watershed drains into the area designated by the LARWQCB as the Los Angeles River Watershed. Several canyons drain rainfall runoff from the Santa Susana Mountains, including Devil Canyon, Browns Canyon, Limekiln Canyon and Aliso Canyon. These canyon areas and drainages remain largely in a natural condition.

Due to major flood events at the beginning of the 1900's, most of the Los Angeles River drainage areas within urbanized portions of the San Fernando Valley were lined with concrete in the 1950's. However, there is a soft bottom river section at the Sepulveda Flood Control Basin. This Basin is 2,150 acres of open space upstream of the Sepulveda Dam, designed to collect flood waters during major storms. Because the area is inundated periodically, it remains in a semi-natural condition supporting wildlife habitat (CRWQCB, 2007).

At the eastern end of the San Fernando Valley, the river bends around the Hollywood Hills and flows through Griffith and Elysian Parks in an area known as the Glendale Narrows. Since the water table is too high to allow for laying of concrete in the channel, this river area has a rocky unlined bottom with concrete-lined or rip-rap sides. This stretch of the river is fed by natural springs and supports stands of willows, sycamores and cottonwoods (CRWQCB, 2007).

South of the Glendale Narrows, the river is contained in a concrete-lined channel down to Willow Street in Long Beach. The Los Angeles River tidal prism/estuary begins at Willow Street and runs approximately three miles before joining with Queensway Bay. The channel has a soft bottom in this reach with concrete-lined sides (CRWQCB, 2007).

Four groundwater basins in the San Fernando Valley contain substantial deep groundwater reserves and are recharged mainly through runoff and infiltration (although the increase in impermeable surfaces associated with continuing urban development has decreased infiltration). The Los Angeles River is connected hydraulically to the San Gabriel River Watershed by the Rio Hondo via the Whittier Narrows Reservoir. Most of the water in the Rio Hondo is used for groundwater recharge during dry weather periods via spreading grounds located in the coastal plain west of downtown Los Angeles (CRWQCB, 2007).

Pollutants originating from dense clusters of residential, industrial and other urban activities have caused water quality problems. The majority of the Los Angeles River Watershed is considered impaired due to a variety of point and non-point sources. The 2006 303(d) list cites pH, ammonia, several metals (including copper, lead and zinc), coliform, trash, scum, algae, oil, chlorpyrifos and other pesticides, and volatile organics as pollutants of concern contributing to water quality impairments. These impairments may be due to water column exceedances of standards for various constituents, excessive sediment levels of pollutants, or bioaccumulation of pollutants in fish or other aquatic organisms. Beneficial uses threatened or impaired by degraded water quality are aquatic

life, recreation, groundwater recharge and municipal water supply (CRWQCB, 1994; CRWQCB, 2007).

Simi Valley Watershed

The Simi Valley Watershed drains into the area designated by the LARWQCB as the Calleguas Creek Watershed. Urban developments are generally restricted to the city limits of Simi Valley, Moorpark, Thousand Oaks and Camarillo. Although some residential development has occurred along the slopes of the watershed, most upland areas remain as open space. Agricultural activities (primarily orchards and row crops) occur in the valleys and on the Oxnard Plain (CRWQCB, 2007).

Mugu Lagoon, at the mouth of the watershed, is one of the few remaining significant saltwater wetland habitats in southern California. The lagoon borders an Area of Special Biological Significance (SWRCB, 2003a) and supports a great diversity of wildlife, including several endangered birds and one endangered plant species.

Aquatic life in Mugu Lagoon and inland streams of this watershed, have been impacted by pollutants from non-point sources. DDT and other pesticides, PCBs and some metals have been found in sediments and biota, and periodic toxicity of surface water has been found (linked to ammonia and pesticides, such as diazinon and chlorpyrifos) (CRWQCB, 2007).

The source of many of these pollutants appears to be agricultural activities (through continued disturbance and erosion of historically contaminated soils), which cover approximately 25% of the watershed along the inland valley and coastal plain. Historical activities and operations at Point Mugu Naval Air Weapons Station (adjacent to and within Mugu Lagoon boundaries) have also contributed pollutants. Other non-point sources include residential and urban activities, which are present over approximately 25% of the watershed. Approximately 50% of the watershed remains in a relatively natural open space condition (CRWQCB, 2007).

Mugu Lagoon, as well as part of the Calleguas Creek Estuary, was designated as a Toxic Hot Spot under the Bay Protection and Toxic Cleanup Program (SWRCB, 2003b) due to reproductive impairment of the clapper rail (an endangered species), exceedance of Office of Environmental and Health Hazard Assessment advisory levels for mercury in fish, and exceedance of thresholds for DDT in fish, and DDT, PCBs, chlordane, chlorpyrifos and metals (copper, mercury, nickel) in sediments, as well as due to sediment toxicity and degraded benthic infaunal community (CRWQCB, 2007). To date, no remediation program has been undertaken to eliminate these water quality problems due to lack of funding and the sensitive nature of habitat present within the lagoon.

The majority of the Calleguas Creek Watershed is considered impaired due to a variety of point and non-point sources. The 2006 303(d) list cites organic compounds (DDT, PCBs, chlordane, chlorpyrifos, endosulfan, toxaphene, dieldrin, dacthal, lindane, and chem. A), metals (copper, mercury, nickel, selenium, boron), nutrients, ammonia, coliform bacteria,

chlorides, sulfates, sedimentation and trash as the constituents contributing to water quality impairments in some or all of the stream reaches or estuary of the watershed (CRWQCB, 2007). Beneficial uses threatened or impaired by degraded water quality are aquatic life, recreation, groundwater recharge and municipal water supply (CRWQCB, 1994; CRWQCB, 2007).

Eastern Watershed

The Eastern Watershed drains into the area designated by the LARWQCB as the Santa Clara River Watershed. This is the largest river system in Southern California remaining in a relatively natural condition. The majority of the watershed is natural open space, although considerable urban, industrial and agricultural development occurs along the main stem of the river. Increasing loads of nitrogen and salts threaten the beneficial uses of irrigation and municipal water supply. Increasing development within the floodplain areas is resulting in increased storm-water runoff and higher sediment and contaminant loadings into the main stem of the river and the estuary (the lagoon at the mouth of the river) (CRWQCB, 2007).

B. Survey Methods

Fire severity, watershed, vegetation type and burned area reflectance maps provided by Cal Fire were helpful in evaluating potentially affected water resources. On-site inspections of canyons and hillsides burned during the fire, as well as residential areas within or adjacent to burned areas, were conducted over several days to evaluate the potential for increased runoff and higher contaminant loadings resulting in adverse water quality impacts within the fire area and in areas downstream and downwind of the burn areas. During field observations, notes and digital photographs were taken, and GPS way points were recorded.

The LARWQCB Basin Plan and Watershed Management Initiative Report were reviewed to provide background information pertaining to water resources that could be affected by the fire and post-fire events. Consultation with experts at the LARWQCB provided information to evaluate potential issues associated with sewage systems and municipal water supplies. Consultation with representatives of the Southern California Stormwater Monitoring Coalition and the results of an August 2008 Workshop on the Effects of Fires on Stormwater Runoff Flows and Mass Loadings provided current information on the probable effects of fires on water quality.

II. Findings of the On-The-Ground Survey (Observations)

A. Identify Values at Risk (Post Fire)

Surface water resources (lakes, streams) within the fire area and areas downstream are likely to be affected by increases in flow, higher sediment loadings and higher contaminant loadings (especially increases in pH, nutrients, metals and some organic constituents) following rainfall events. Surface waters within the fire area and in areas

downwind of the fire are likely to be affected by aerial deposition of contaminants associated with smoke and ash carried by prevailing winds during the fire and from ash residues transported by winds after the fire.

Impacts to sewage systems (septic tanks and sewered systems) could occur in affected waterways due to increases in water velocity and sediment loads, resulting in erosion and/or destruction of leach lines, septic tanks and associated plumbing or sewer collection lines. Releases of raw sewage into waterways may occur through rupture or flooding of sewage systems. Such releases probably would result in increased bacterial levels within streams and could pose a human health risk through pathogen exposure.

Impacts to groundwater resources utilized as municipal water supplies could occur in affected areas due to increases in contaminant loadings associated with runoff from burned areas. Contaminants could be introduced into aquifers or wells through infiltration of runoff, particularly in areas with spreading grounds designed for groundwater recharge.

a) Specific Observations

<u>Water Quality Impacts</u>

Approximately 1,953 acres burned within the Simi Valley Watershed, representing approximately 19% of the overall Sesnon Fire burn area. Visual observations and review of the burn severity map generated after the fire indicate that the majority of the burned area in the Simi Valley Watershed appears to have been of low severity, with limited areas of moderate severity burn. Although some increase in storm runoff flows and higher than normal sediment loadings (along with higher contaminant loadings) could be expected from the Las Llajas Canyon and Chivo Canyon drainages, it is unlikely that flows and loadings would increase substantially in such relatively lightly burned areas. The Las Llajas Debris Basin was evaluated during a field visit. Both visual observations and discussions with maintenance staff from the Ventura County Watershed Protection District indicate that the debris basin has ample capacity to handle anticipated sediment loads even with the burning that occurred in Las Llajas Canyon, Chivo Canyon and other areas draining into this basin. Substantial volumes of sediment have been removed from the Debris Basin over the past two years, ensuring that an extremely high retention capacity is maintained.

Flowing water was observed in portions of the Las Llajas Canyon drainage. Contaminants, such as nitrates and phosphates, metals (particularly copper, lead, nickel and zinc) and organic compounds (particularly polynuclear aromatic hydrocarbons) may occur in higher levels than normal in the stormwater runoff from burned areas, adversely impacting water quality and aquatic life in this stream (although the effects of post-fire runoff on biological communities have not been well studied or quantified).

Las Llajas Canyon and Chivo Canyon are tributary to Arroyo Simi which drains into Calleguas Creek and eventually into Mugu Lagoon at the base of the watershed. Although most of the sediment load (and many pollutants, such as metals and organics, which tend to be bound to particles) probably will be deposited within the Las Llajas Debris Basin, some finer particles and dissolved contaminants probably will flow through the debris basin and into Arroyo Simi, Calleguas Creek and Mugu Lagoon. This additional contaminant load could cause adverse water quality impacts or worsen existing conditions, given that many of the waterways in this watershed are already impaired for nutrients, metals and organic constituents. Aerial deposition from smoke and ash during and after the fire could also contribute contaminants to waterways, although the impact may be minor since only 19% of the fire occurred within this watershed and burn severity was generally light to moderate.

Approximately 135 acres (1% of the Sesnon Fire area) burned within the Eastern Watershed. Areas just below the ridge line appeared to be lightly burned. Given the small size and light severity of the burn area, it is unlikely that any slight increases in sediment and contaminant loading would affect water quality in the waterways in this watershed. Prevailing winds appeared to carry smoke and ash toward the south, so it also is unlikely that aerial deposition would contribute contaminants to waterways in this watershed.

Approximately 11,812 acres (80% of the Sesnon Fire area) burned within the Bull Canyon Watershed. The highest severity burn areas were observed within the Browns Canyon drainages, although even in this area, the fire effects were very patchy with large lightly burned areas interspersed with smaller moderately to severely burned areas. This drainage system appears to have the highest potential for substantially increased flows and higher than normal sediment loadings (along with higher contaminant loadings), but even here increases would not be expected to be extraordinarily high given the relatively small amount of severely burned area. A relatively large debris basin was observed at the base of Browns Canyon, which appears to be regularly maintained and should have adequate capacity to handle anticipated sediment loads.

Flowing water was observed in lower portions of the Browns Canyon drainage. Contaminants, such as nitrates and phosphates, metals (particularly copper, lead, nickel and zinc) and organic compounds (particularly polynuclear aromatic hydrocarbons) may occur in higher levels than normal in storm-water runoff from burned areas, adversely impacting water quality and aquatic life in this stream (although the effects of post-fire runoff on biological communities have not been well studied or quantified).

The other major drainages, including Devil Canyon, Limekiln Canyon and Aliso Canyon, were observed to have experienced low to moderate burn severity. Some increases in flows and sediment loadings (along with higher contaminant loadings) could be expected, but should only be moderately higher than normal given the modest level of burn intensity. Relatively large debris basins were observed at the

base of Limekiln Canyon and Aliso Canyon, which both appear to be regularly maintained and have very high capacity for sediment retention. A somewhat smaller debris basin was observed at the base of Devil Canyon, but this well-maintained debris basin should also have adequate retention capacity given the smaller size of this drainage system.

Browns Canyon and Devil Canyon drain into major concrete flood control channels joining the main stem of the Los Angeles River west of the Sepulveda Basin. Limekiln Canyon and Aliso Canyon also drain into major concrete flood control channels and join the main stem of the Los Angeles River west of the Sepulveda Basin. Although most of the sediment load (and many pollutants, such as metals and organics, which tend to be bound to particles) will be deposited within the debris basin at the base of each of these four canyons, finer particles and dissolved contaminants probably will flow through the debris basin and downstream into the Sepulveda Basin, which supports wildlife and aquatic habitat. This additional contaminant load may cause adverse water quality impacts or worsen existing conditions, given many of the waterways in this watershed already are impaired for nutrients, metals and organic constituents. Aerial deposition from smoke and ash during and after the fire could also contribute contaminants to waterways, given that 80% of the burn lies within this moderately to severely burned area.

The Santa Monica Bay Watershed Management area lies outside of the Sesnon fire burn area. However, it is possible that prevailing winds carried smoke and ash during and after the fire into these watersheds and aerial deposition could contribute contaminants to waterways, including the two major stream systems (Ballona Creek, Malibu Creek) in the watershed. Smoke and ash from the fire was deposited in the Westlake/Agoura residential areas (personal observation), at least during the first day of the fire, and this material could be transported by stormwater runoff into Malibu Creek, Westlake Lake, Lake Lindero, Lake Sherwood and Malibou Lake. A previous monitoring study has shown that ashfall from the 2003 Simi Valley fire increased metals and polynuclear aromatic hydrocarbon levels in stormwater runoff entering the Ballona Creek, even though this unburned area is more than 30 miles from burned areas (Stein, 2008).

Conversations with local fire fighters suggest that prevailing winds were blowing generally towards the south during the fire, so it does not appear that smoke or ash would have been transported northward into the Santa Clara River Watershed (north of the ridge line along the northern boundary of the burned areas).

No major lakes were observed during field reconnaissance within the burn area; although as noted above, several lakes may be downwind of the fire zone and may have received some contaminant loading via aerial deposition of smoke and ash during and after the fire.

Sewage Systems

The majority of the burn areas are in non-residential natural canyons and hillsides where there are virtually no sewage systems at risk (with the exception of a few scattered residences and gas and oil operations). However, these residences and facilities were well protected from actual fire damage and it appears unlikely that any sewage system failures would occur as a result of the fire. Residential areas within or near the fire burn area were also largely protected from significant fire damage, and all these residences are in sewered areas (i.e., no areas served by septic tanks), and the risk of sewage system failure appears to be low.

Municipal Water Supply

The majority of the burn area (80%) falls within the Bull Canyon Watershed, tributary to the Los Angeles River Watershed system (as designated by the LARWQCB). Most of the sediment loading carried by post-fire runoff during rainfall events would be expected to settle in debris basins located at the base of Devil Canyon, Browns Canyon, Limekiln Canyon and Aliso Canyon. However, contaminants bound to finer sediment particles may not settle out and dissolved contaminants could be carried farther downstream where there could be infiltration into local groundwater aquifers or wells. However, since most wells are quite deep and given the long distance between the burn areas and the major groundwater recharge area (Rio Hondo), it is unlikely that groundwater resources will be adversely affected.

A smaller portion of the burn area (19%) falls within the Simi Valley Watershed (designated as Calleguas Creek Watershed by the LARWQCB). Most of the sediment loading carried by post-fire runoff during rainfall events would be expected to settle in the debris basin located at the base of Las Llajas Canyon. However, contaminants bound to finer sediment particles may not settle out and dissolved contaminants could be carried farther downstream where there could be infiltration into local groundwater aquifers or wells. The Simi Valley Groundwater Basin is the major groundwater basin in this area; however, the quality of the groundwater is considered unsuitable for many municipal uses due to high total dissolved solids concentrations (Simi Valley General Plan, 2007). There are a few deep wells, but these are unlikely to be significantly impacted by runoff from post-fire runoff from the lightly burned areas of the Sesnon fire (these resources already are monitored due to potential effects from the 2003 Simi fire).

Only 1% of the burn area is within the Eastern Watershed (designated as Santa Clara River Watershed by the LARWQCB). It is unlikely that post-fire runoff during rainfall events would produce any noticeable increase in sediment or contaminant loadings.

III. Emergency Determination

Although post-fire runoff and aerial deposition from ash and smoke may produce adverse water quality impacts, the fire is not expected to result in any emergency conditions with respect to water quality, sewage systems or municipal water supplies.

IV. Treatments

Not applicable.

V. Discussion/Recommendations

Periodic wildfires (see Figure 12) are a natural component of southern California's forest and scrubland and are essential to maintaining overall ecological health of these systems. However, the frequency and intensity of wildfires has increased in association with human activities in and near natural forest and foothill areas (Syphard et al., 2007). Although the effects of fire on hydrologic response and sediment loads in Southern California have been noted for over 80 years, very little data is available to quantify or predict the impacts of fires on water quality. However, historic records for Southern California indicate that total runoff volume may increase by 25% and peak storm flow rates may increase five-fold following fires (SAWPA 2004).

Frequent wildfires can alter soil chemistry and storm water runoff characteristics, which can result in adverse effects to downstream water quality. Increased storm flow and sediment runoff following fires have been associated with increases in loads of nutrients (e.g., phosphate and nitrate), metals, and certain organic pollutants. Several researchers have found that dioxins are emitted, re-suspended, and volatilized by forest fires (Gullet and Touati, 2003; Meyer et al., 2004). In addition, combustion of plants and natural materials also release metals (Yamasoe et al., 2000), polynuclear aromatic hydrocarbons (Jenkins et al., 1996), and nitrogen compounds (Hegg et al., 1990). The magnitude and persistence of increased loading of sediment, organic matter, and nutrients is a function of fire intensity and may persist for months to several years (Gimeno-Garcia and Rubio, 2000). Increased nitrate levels were produced from the San Dimas experimental forest in Glendora, California following fires, with higher levels persisting for up to ten years (Riggan et al., 1994).

In addition to the direct effects of storm-water runoff from burned landscapes, indirect effects may occur as smoke and ash are transported by winds during and after the fire. Aerial deposition of this windblown material can markedly increase the quantity of various pollutants deposited onto the ground in unburned areas. For example, during the

severe 2003 Southern California forest fire season, atmospheric deposition increased the amount of copper, lead, and zinc deposited onto the ground by factors of four, eight, and six, respectively, at an unburned site in the San Fernando Valley that was approximately 30 miles from the southeastern border of the Piru/Simi Fires (Sabin et al., 2005). Similarly, increased nitrate transport was reported following the Yellowstone Park fires of the late 1980's associated with ash fallout, with increased rates persisting for approximately four years (Gerla and Galloway, 1998). Most recently, ash collected immediately following the 2007 southern California wildfires was reported to have high pH (12.5-12.7) and elevated levels of arsenic, lead, copper, and zinc (hundreds to thousands of parts per million) (Plumlee et al., 2007).

Unfortunately, routine monitoring and assessment of post-fire runoff seldom occurs, despite potential effects on downstream water quality. When it does occur, efforts are poorly coordinated and the resultant data are difficult for storm water managers to access. This lack of coordinated monitoring is particularly problematic in southern California, because watersheds affected by fire often drain to waterbodies that have been designated as impaired under Section 303(d) of the Clean Water Act, often for the same constituents found in post-fire runoff. Consequently, the contribution of metals, nutrients, and organic contaminants from post-fire runoff to receiving waters is poorly understood in terms of both the magnitude of potential effect and the persistence of the influence of post-fire runoff. Impacts of increased runoff flows, higher sediment loadings and higher contaminant loadings on habitat conditions and biological communities within streams and other waters are also poorly understood.

The lack of a coordinated post-fire monitoring program results from several factors: First, there is no standardized procedure for post-fire water quality monitoring identifying a standard set of constituents and monitoring protocols appropriate for assessing water quality following fires. Second, resources are often scarce following fires, making it difficult for various entities to coordinate. Third, there is no regional entity responsible for coordinating post-fire sampling, compiling the resultant data, and disseminating the information back to mangers at the local municipality level. Fourth, because fires occur unexpectedly, there is often insufficient available funding for conducting post-fire sampling.

To help address the current information gap, the Stormwater Monitoring Coalition (SMC) is initiating development of a regional post-fire water quality sampling program. The SMC is a cooperative of storm water regulators and municipal storm water management agencies throughout southern California that have developed a collaborative working relationship. The intent of this program is to facilitate integrated regional assessment in order to more effectively document the effects of fires, improve regional coordination, and provide a mechanism to communicate acquired information back to managers. The program will consist of an implementation plan and a funding strategy. Many

stakeholders are involved in the development of this program, including representatives from Cal Fire. A draft document containing monitoring recommendations should be available before the end of 2008, and the final plan, including a potential funding strategy, should be completed in early 2009.

1. Expect higher than normal storm runoff flows with higher than normal sediment loadings from burn areas in all rain events. Expect higher pollutant concentrations, particularly for nutrients, polynuclear aromatic hydrocarbons, and metals (especially copper, lead, nickel and zinc) and higher pH levels in storm-water runoff from burn areas. The higher the rainfall intensity, the higher the runoff flows, sediment loadings and pollutant loadings are likely to be throughout all Sesnon Fire burned area drainages.

2. Notify the Los Angeles County Department of Public Health and the Ventura County Environmental Health Division of the potential for raw sewage leaks or spills to occur due to possible post-fire increases in erosion, sediment loadings and flooding (although the potential risk should be low).

3. Notify local water districts, well owners and water purveyors of the potential for contamination of groundwater aquifers and wells due to increased sediment and higher contaminant loadings associated with stormwater runoff flows from burned areas and possible aerial deposition of contaminants from smoke and ash during and after the fire (although the potential risk should be low).

4. Clean out major debris basins (Las Llajas, Devil Canyon, Browns Canyon, Limekiln Canyon, Aliso Canyon) as soon as possible after the end of the winter rainy season to remove sediment and associated contaminants and prevent future transport to downstream areas where short-term or long-term adverse water quality impacts could occur.

5. Conduct pre-storm and post-storm monitoring in Arroyo Simi (Simi Valley Watershed) and in the Glendale Narrows (Bull Canyon Watershed) to assess the impacts of post-fire stormwater runoff on water quality, aquatic habitat and aquatic communities. Monitoring should conform to the recommendations of the Southern California Stormwater Monitoring Coalition (contact Dr. Eric Stein, Southern California Coastal Water Research Project, erics@sccwrp.org) for details.

6. Conduct post-fire monitoring in Malibu Creek, an unburned watershed area, to assess the impacts of aerial deposition of contaminants associated with smoke and ash transported by prevailing winds during and after the fire. Monitoring should conform to the recommendations of the Southern California Stormwater Monitoring Coalition (contact Dr. Eric Stein, Southern California Coastal Water Research Project, erics@sccwrp.org) for details.

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VII. Contacts

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DRAFT TECHNICAL SPECIALTIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) Report

Resource: Soils

Fire Name: SESNON CA-LAC-08231953 November 2008

Author Name: Abiodun Aderonmu, Water Resources Engineer
California Department of Water Resources
Southern District
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I. Resource Condition Assessment

A. Setting:

The 14,703 acre Sesnon Fire burned Federal, State, City and private lands. This assessment is an evaluation of soil conditions in the burned areas upslope of assets at risk. Areas evaluated are Oat Mountain to the north and west, from Las Llajas Canyon in Ventura County to Aliso Canyon on the eastern perimeter. The foothills are bounded on the south by the communities of Porter Ranch, Twin Lakes, Indian Hills and residential areas south of Evening Sky Road in Ventura County.

Potential features at risk from debris flows, mudslides and flooding identified by the State Emergency Assessment Team (SEAT) include: people, homes, water supplies, wildlife, drainage crossings, roads, bridges and parks.

The Burn Area Reflectance Classification (BARC) map shown in (see Figure 5) indicated burn severity levels ranging from high (a small percentage) to moderate and low severity. Moderate and high burn soil severity can alter how water infiltrates into the soil and lead to increases in storm-water runoff, erosion, stream and peak flows during storms, and turbidity and sediment transport. High and moderate soil burn severity areas exhibit moderate hydrophobicity, a condition of water repellency created by intense heat, which essentially cooks the soil, breaking down organic matter and chemicals, which releases a waxy substance coating soil particles and reducing infiltration. The hydrophobic layer is generally one-half to-three inches beneath the soil surface and is commonly up to one inch thick. Hydrophobic effects are most severe during the first storms of the next rainy season.

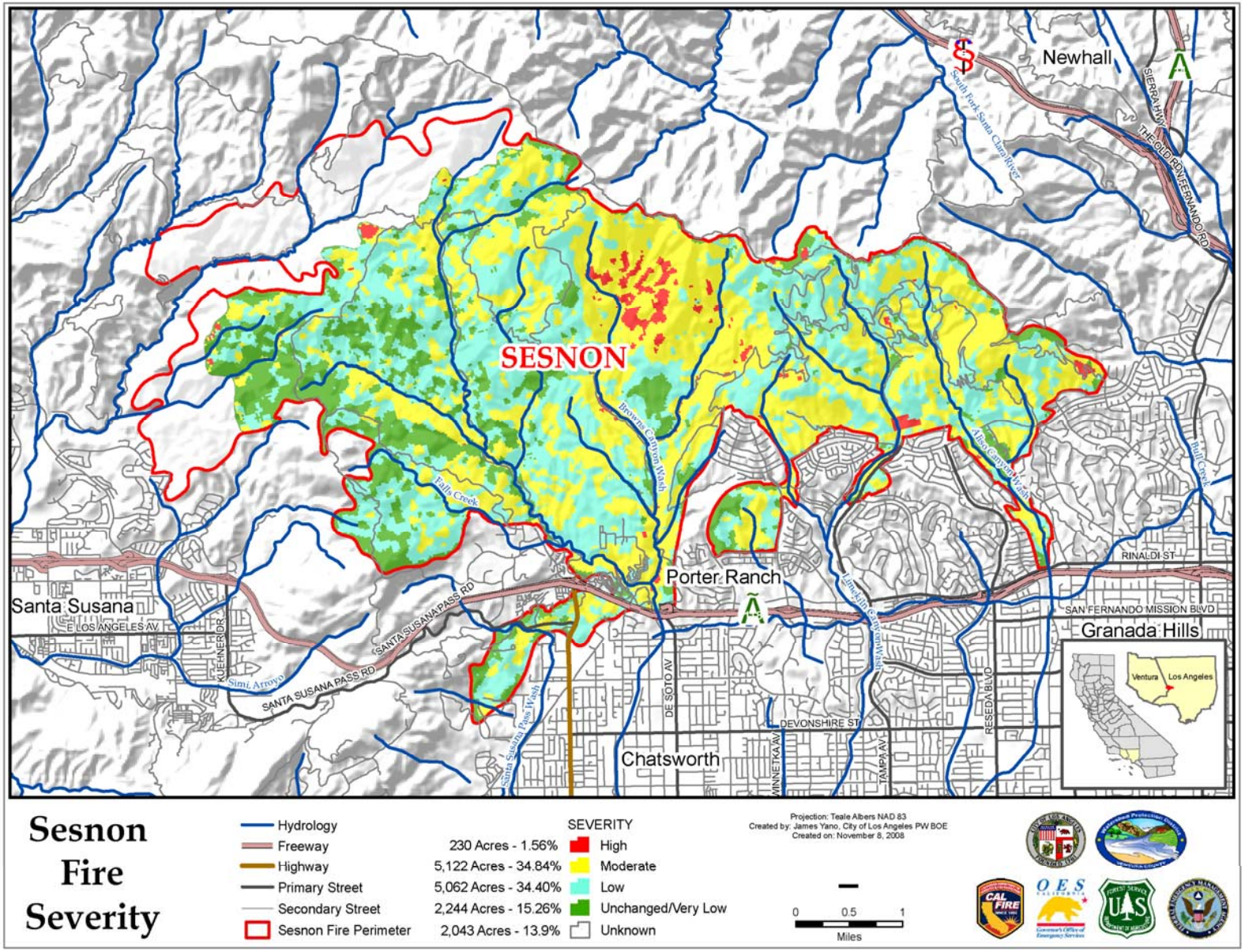

Fig. 5: BARC Map

B. Survey Methods

The team evaluated the site by conducting soil hydrophobicity tests in several locations within the burned area and reviewed and matched the BARC Map with field observations. These evaluations were supplemented by reviewing County soil survey documents and other specialized reports. The BARC map generally confirmed the findings. However, it was modified slightly based on observed post-fire vegetation and water repellency conditions.

II. Findings of On the Ground Survey (Observations)

The field survey found a weak water repellent layer at the contact between soil surface and overlying ash and/or litter layers of most burned areas and a more persistent water repellent layer in the smaller, high burn areas. Shallow water repellent layers are expected to break down during the first winter storms. Hydrophobicity was determined to range generally from moderate to low, with patches of high in a few locations. This is consistent with the burn severity acreages as shown in Table X. It should be noted that the BARC map provided did not have data for the north western portion of the burn: this area is designated as unknown in the Table 1. Burn severity classes are based on guidelines developed by Frazier (1989) in Appendix I of this report.

Table 1: Burn Severity Acreage

Burn Severity	**Percent Burned (%)**	**Area Burned (acres)**
High	1.56	230
Moderate	34.84	5,122
Low	34.40	5,062
Unburned	15.26	2,244
Unknown	29.12	2,045
	Total	**14,703**

Due to relatively small portions of high burn severity, it is anticipated that these effects will modestly increase erosion and the intensity of debris and mud flows and flooding within the watershed. Erosion severity is influenced by topography, including slope, and climactic factors, such as duration, intensity and amount of rainfall. Slopes observed while investigating values at risk ranged from 20%, to more than 60%. Soil texture can influence erosion potential: soil texture observed during the assessment was determined

to be largely medium-coarse to coarse, indicating a high potential for erosion. Types of erosion that can occur include sheet and rill erosion, soil creep, and mass wasting.

III. Emergency Determination:

- Although erosion and flooding mudflows are considered naturally occurring phenomenon during pre-fire conditions, burn severity combined with slope steepness accelerates the process. Post-fire erosion on hillslopes and sediment transport in stream channels will be greatly increased for many years following the fire, especially in response to the first large storms.

- Increased post-fire runoff can cause erosion of canyon roads and failure of stream crossings.

- There will be an increased risk of flooding depending on the frequency and intensity of winter storm events. This will pose a hazard to homes and other values located downstream.

IV. Treatments to Mitigate the Emergency:

The objective is to minimize erosion on slopes and thereby reduce sediment laden floodwaters likely to occur during large rainstorms. However, treatment for the burn area will be very difficult due to rugged, steep sloped topography. Landscape level treatments for erosion control are either extremely expensive (e.g. aerial application of mulch or grass seeding) or not likely to be successful during the first storms, that generally lead to the majority of erosion.

Relevant agencies and/or property owners should consider implementing Best Management Practices (BMPs) to protect homes and assets located downstream from the burn area, and designated as moderate to high risk for debris flow and flooding.

BMPs are:

- Fiber Rolls (straw, flax or other material)
- Gravel Bag Berms
- Sand Bag Berms
- Geotextiles and Mats (erosion control blankets)

The description, installation, and operation of these practices are well documented in the California Storm-water BMP Construction Handbook and the Burned Area Emergency Response Treatments Catalog. During the field survey, the team was pleased to note that some of these BMPs are being proactively implemented at some of the sites.

V. Recommendations:

Landscape level erosion control treatments are impractical for treating the entire fire area, but mulching, fiber rolls and straw bales with silt fencing may be used to prevent erosion at high value sites or to prevent runoff damage to specific roads or site improvements.

Timely maintenance after storm events of road drainage crossings and catch basins can help keep roads open and homes safe.

In addition to sediment from hillslopes, erosion from roads and firelines can also be sources of sediment. Post-fire erosion control measures should be applied to areas disturbed by fire suppression activities, such as dozer lines, to help prevent sediment production.

In order to reduce impacts of un-regulated off-highway use, especially along steep slopes, it is recommended that signs be posted to deter such activities. Road access could also be limited by maintaining locked gates at entrance points to major roads.

VI. References:

The Natural Resources Conservation ServiceSoil Conservation Service. Soil Survey of Los Angeles County, California, West San Fernando Valley Area. http://soildatamart.nrcs.usda.gov

California Soil Survey Committee, 1989

Burn Severity Classes, (FRAZIER 1989).

California Stormwater BMP Construction Handbook
http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf

Burned Area Emergency Response Treatments Catalog
www.fs.fed.us/eng/pubs/pdf/BAERCAT/lo_res/06251801L.pdf

Appendix I

BURN SEVERITY CLASSES (FRAZIER 1989).

1. High Severity

    a. Hydrophobicity—soils are strongly water repellant; they will repel water for greater than 40 seconds. Very strongly hydrophobic soils may repel water for several minutes or longer. Hydrophobicity may be from the soil surface downward, from about 1/8 of an inch in depth to many inches, or it may begin below surface.

    b. Organic Ground Cover Density—less than 20% cover of litter, duff, or woody debris remains. Often fully consumed in very high severity burns.

    c. Vegetation—Trees: crowns fully burned, no needles or leaves remaining. Some or many branches may be consumed. Brush: crowns partially or fully volatilized; no leaves remaining. Herbaceous plants: usually fully consumed, often including roots and sometimes, residual seed.

2. Moderate Severity

    a. Hydrophobicity—soil will repel water for 10-40 seconds. Longer than that is strong hydrophobicity; less than that is weakly hydrophobic.

    b. Organic Ground Cover Density—Approximately 20-50% density.

    c. Vegetation—Trees: crowns remain but needles/leaves are singed to the extent that more than 50% of the crown is discolored (i.e., the crown of a pine tree has more than half to all the needles browned by fire). Brush: crowns remaining but leaves mostly discolored by burn. Herbaceous plants: mostly consumed, but patches remain.

3. Low Severity

    a. Hydrophobicity—soil will repel water for less than 10 seconds. Often water will infiltrate within a second or two.

    b. Organic Ground Cover Density—greater than 50% density. Often the fire will consume only fine woody debris and scorch the surface of a duff layer.

    c. Vegetation—Trees: crowns remain. Fire will often only scorch the tree bole and perhaps a few lower branches on smaller trees. All or nearly all the crown will remain green. Shrubs: mostly unburned, but some scorching may be present on lower parts. Herbaceous plants: usually singed or partially burned, but will recover.

DRAFT TECHNICAL SPECIALIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) Report

Resource: Civil Engineering

Fire Name: SESNON FIRE CA-LAC-08231953 November 2008

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I. Resource Condition Assessment

A. Setting

The 14,703 acre Sesnon Fire burned federal, state, and private lands. This assessment is an evaluation of soil conditions in the burned areas upslope of assets at risk. Areas evaluated are Oat Mountain to the north and west, from Las Llajas Canyon in Ventura County to Aliso Canyon on the eastern perimeter. The foothills are bounded on the south by the communities of Porter Ranch, Twin Lakes, Indian Hills and residential areas south of Evening Sky Road in Ventura County.

Fires greatly alter physical characteristics of hillside slopes, stripping natural protective vegetation cover, organic litter and removing barriers that stabilize soil and hold sediment. In addition, chaparral vegetation in Southern California has a natural tendency to develop water repellent soils due to their naturally high wax content. This water repellency dramatically increases after a wildfire because waxes vaporize and are driven into the soil by heat. Water repellency reduces infiltration and increases runoff rates. According to the U.S. Forest Service (USDA Forest Service Gen.Tech.Rep. RMRS-GTR-63.2000), peak flows increase 500 to 9600 percent during the first year after a fire. As a result, burned watersheds generally respond to runoff faster than unburned watersheds and commonly produce flash floods, debris flows, and landslides, which can be devastating to property and human life.

Potential features at risk from debris flows, mudslides and flooding identified by the State Emergency Assessment Team (SEAT) include: people, homes, water supplies, wildlife, drainage crossings, culverts, roads, bridges and parks.

B. Survey Methods

To evaluate the risk to life and property, field reconnaissance was conducted from October 29 through November 7, 2008. The entire burn was inspected to identify where high-value sites may be present, with the assessment concentrating on developed residential areas. Road and foot inspections were conducted in areas with high value sites. Potential assets at risk were identified and then GPS points, photos, measurements, and notes were taken in order to evaluate the asset at risk. Rural areas where no houses, businesses, or other high-value risks were identified, were viewed from a distance, but, were not specifically surveyed on the ground.

II. Findings of the On-the-Ground Survey (Observations)

The State Emergency Assessment Team (SEAT) assigned to the Sesnon Fire inspected the burned area October 29, 2008 through November 7, 2008, as an entire team and with specialist groups. All the significant portions of the burn area were observed for potential impacts to soil, water resources and identified values-at-risk.

The following sites were considered in need of special structural/civil engineering assessment and action recommendations as a result of the overall survey of the burn area:

Table 1 – Engineering Assessment Sites

Site No.	Site Title Description	Improvement
102	Sulfur Springs Guzzler	Fire road adjacent to wild life guzzler
117	Browns Canyon Timber Bridge	Burned timber bridge across Browns Creek on Browns Canyon Road.
138	Browns Canyon Concrete Bridge and Debris Basin	Reinforced concrete bridge across Browns Creek on Browns Canyon Road.
119	Browns Canyon Sediment Disposal Site	Large debris basin north of 118 freeway with a concrete spillway with a drop of approximately 60 feet.
132	19066 Kilfinan Place	Burned residence
141	12291 Derwent Avenue	Minor damage to 2 residences adjacent to fire area.

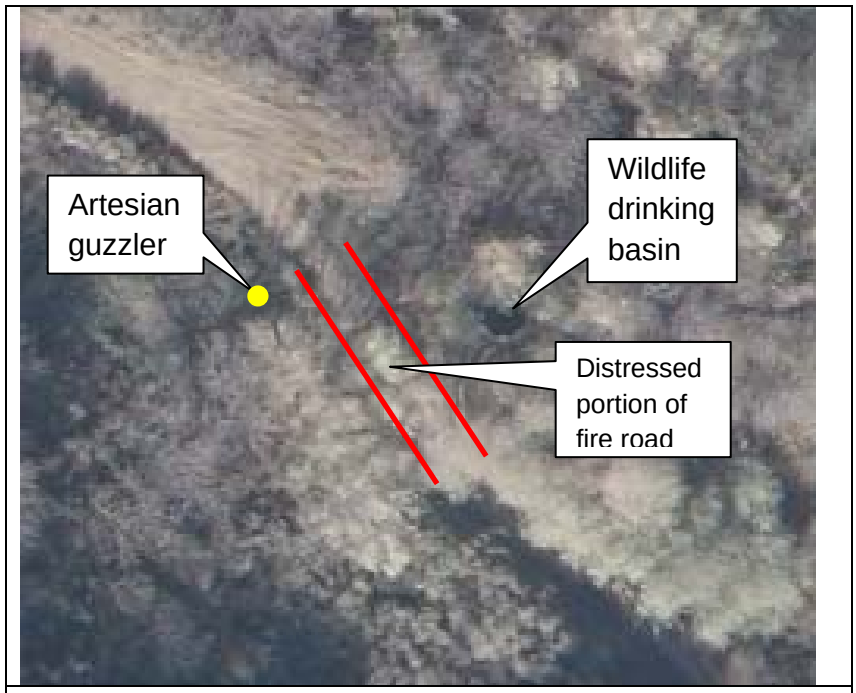
In addition to the above listed areas, lives and property are potentially at risk at sites in flood prone areas, or on roads where flash flooding causes washouts due to runoff in excess of culvert capacity. In this area, known for consistent high winds, additional hazards can be falling burned and dead trees and limbs along major street corridors or hiking and equestrian trails. Regional water quality supply is potentially at risk from loss of water control on hill slopes. More information is covered in the Hydrology, Geology, Wild Life, and Botany reports for this fire assessment, which also reference the above-mentioned sites.

A. Identify Values at Risk

Site No. 102 – Sulfur Springs Guzzler (Thomas Guide Map pg 481, grid A4)

Site Setting

Sulfur Springs fire road is located in O'Melveny Park in the northwestern portion of the San Fernando Valley in the Granada Hills area of the City of Los Angeles. The fire road begins from Neon Way at the southern termini and continues to Mission Peak at the gated northern end of the roadway. A gas company facility is beyond the gate. In the location of the "guzzler," Sulfur Springs Road is an unpaved fire road approximately 9 feet in width with a 2:1 upslope to the west and a 1:1 to 1½:1 downslope to the east. The area appears to be mostly used by hikers.



Site No. 102 – Photo1, Aerial Photo of Sulfur Springs Fire Road near the "guzzler"

Roadway Existing Condition:

On the northwest side of the distressed portion of the fire road is an artesian guzzler or possibly a well that is letting water come down the slope and onto the unpaved fire road. A pipe laid across the roadway takes water from the guzzler to a wildlife drinking basin on the east side. The continual flow of water from the guzzler is washing out the fire road as shown in the aerial photo above.

Recommended Action

This site does not qualify as an immediate threat, however, that might change if storm events of high intensity occurred during initial precipitation.

While the fire road was not damaged as a result of the Sesnon Fire, access to the burn area for storm debris removal as a result of the fire, fire prevention, and emergency response, requires the roadway to be passable by heavy duty and emergency vehicles and equipment. The running water needs to be canalized. Based on a visual assessment, the artesian condition was producing approximately 5 gallons/hour. The water can be split between the drinking basin and the remainder can be put into the drainage on the east side of the fire road. A catch basin style structure needs to be built adjacent to the artesian well and a CMP pipe can be placed into the roadway to transport the water to the drinking basin where another pipe (water canon style) should spill the overflow into the drainage below. The fire road may require a retaining structure to bring it back to a passable width. Batter board and bulkhead pile and lagging retaining walls would be recommended. Further analysis and a repair design for the fire road should be prepared by the agency controlling this area within the near future.

Site No. 117 – Browns Canyon Timber Bridge (Thomas Guide Map pg 480, grid B7)

Site Setting

Browns Canyon in the area of the bridge is a local residential asphalt paved roadway traversing north and south. The bridge is the only access to the community of 5 ranches, horse boarding operations and a park.

Thomas Brothers Maps, Thomas Guide, shows the area as Browns Creek Park. The roadway in the area of the bridge is approximately 25 feet in width and with a slight upgrade at the north end of the bridge. Access to the area is from De Soto Boulevard traveling north from the 118 Freeway, in the Porter Ranch area of the City of Los Angeles and intersecting portions of the unincorporated portions of the County of Los Angeles. It was not clear at the time of our assessment if the bridge was in City of LA, County of LA, or private right-of-way. The bridge was open to local traffic before its closing initiated by this team on November 5, 2008. Traffic on the bridge during the assessment was observed to be 20-60 vehicles per hour, with additional pedestrian and equestrian crossings.

Existing Condition

The bridge is a timber structure bridge with a concrete overlay (slab thickness 5.75 to 7 inch) for the wearing surface of the travel way. The bridge does not have sidewalks or curbs along the edge of travel way. The Bridge is 47 feet in length and 21 feet in width. The bridge has two timber retaining wall style abutments, and one timber bent. Timber stringers run the length of the travel way below the concrete slab, supported by the abutments on the north and south and a timber post and beam bent in the center. Hand digging at the south end of the bridge adjacent to a broken piece of the slab and coring of the slab the fire department, did not show signs of steel reinforcement in the concrete slab (existence of steel reinforcement in the slab could not be

determined). On either side of the bridge is a drop of approximately 4 feet to a sandy creek bed. The perennial creek had low flow at the time of this investigation, but had flows up to the bottom of the concrete slab (indication of full flow through the bridge openings) according to the residents. Currently, the bridge does not have guardrail or hand rail along the edge of travel way. The bridge was temporarily re-supported by steel I-beams in transverse direction on stacked timber cribbing resting in the creek bed at four locations. The steel I-beams run perpendicular to the travel way, one adjacent to each abutment, and one on each side of the existing timber bent. The I-beams were placed directly below the existing timber stringers, which are supporting the concrete overlay on top of the bridge (see Photo 1, below).

Site 117 – Photo 1, Bridge structure looking north. Temporary supports below slab

Damage Assessment

All of the timber structure has been compromised by fire damage. The bridge can be described as a "total loss".

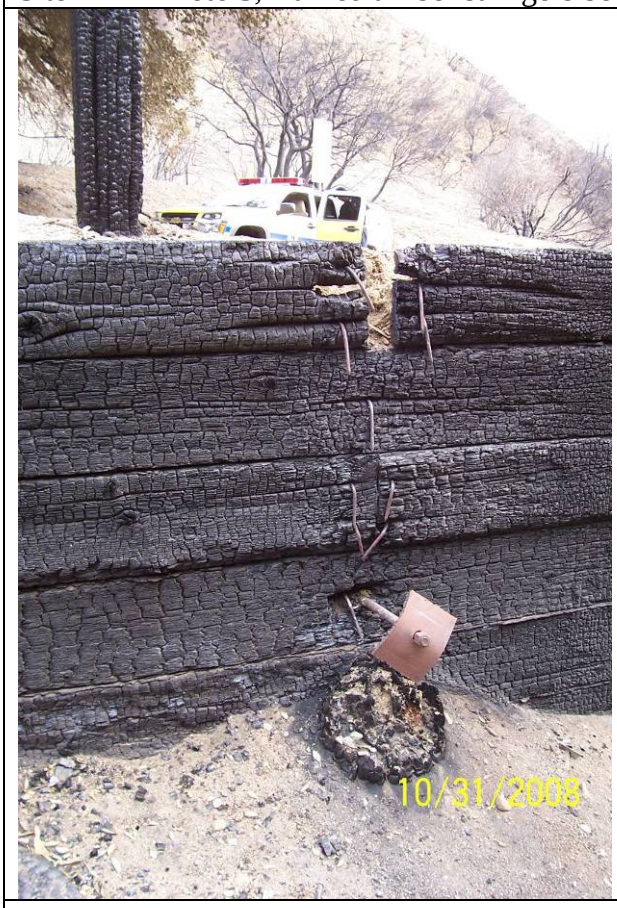
The timber abutments are mostly burned through and are beginning to allow slough off of the backfill into the creek bed. The piles and tie-back supports that are a structural element of the abutments are no longer functional. The tension buckles that prevent lateral sway of the bridge structure are no longer functional. There are old and new cracks on the bridge deck running laterally across the travel way. It was not know if the cracks run through the entire depth of the concrete deck. New cracks were observed adjacent to the transition from the concrete slab of the bridge and asphalt roadway at the southern abutment (this can be contributed to slight sway of the bridge from heavy vehicle loading).

The timber bent of the bridge has been burned through and is no longer functional. The lateral reinforcement buckles are not founded in solid timber and some are missing. A majority of the timber structure has burned.

The guardrail posts and guardrail of the bridge are missing or burned. This allows a 4-foot drop on either side of the edge of travel way. No sidewalk, curb, or other edge of pavement delineator is present of the bridge.

Site 117 – Photo 2, Burned south abutment wall and pier with loose tie-back. Abutment backfill beginning to slough.

Site 117 – Photo 3, Burned timber stringers below concrete travel-way slab



Site 117 – Photo 4, Burned south abutment west wing wall. Loose/nonfunctional tie-back.

Temporary Measures

Upon assessment of the bridge, traffic was immediately restricted to single lane light vehicle (max 6000 lbs.), local traffic only. Lighted barricades were placed on the bridge to delineate the roadway and a monitoring program was initiated. The program consisted of daily visual

observation and point monitoring to watch for movement in the slab cracks and at the abutments (see photo 5 and 6 below – 15 points in total were set on the bridge deck).

Site 117 – Photo 5, monitoring points (white) on bridge

Site 117 – Photo 6, measuring crack on bridge slab (MP 4)

The monitoring program of the concrete slab showed slight rotational movement of the slab in relation to the AC roadway, and 1-2mm of crack gap increase over a 24-hour period. This movement was attributed to continued heavy vehicle traffic over the bridge and slight settlement of the temporary shoring under the bridge in the soft soil creek bed.

On November 5, 2008, the bridge was closed to all traffic as a precaution against catastrophic failure due to the following:

- Continued use of the bridge by heavy vehicle traffic causing large deflections in the slab and settlement of the temporary shoring.
- Settlement and movement was measurable in the pre-set monitoring points.
- The presence of reinforcement steel in the bridge's slab could not be determined.

- The timber stringers (longitudinal structural members) of the bridge had only 20-30% of solid wood remaining post fire. Some members were missing entirely (see photo 3).
- Because of the above reasons, the 14 and 13 foot longitudinal spans between the temporary supports and burned out timber stringers could allow for a catastrophic failure of the bridge slab should enough deflection occur.

At the recommendation of this team and the Los Angeles County Department of Public Works (LADPW), the LADPW constructed an "Arizona Crossing" style culvert on the east side of the bridge to allow access to the community and park north of the bridge. The timber bridge now has a hard closure with k-rail barriers at the north and south abutments.

The new crossing is comprised of on-site soil, gravel, and rock. The travel-way is crushed aggregate base (CAB) over soil. Two 24-inch pipes have been placed below the crossing to allow for dry weather flow of the perennial creek. Large rock rip-rap was placed on the east side of the crossing (creek entry) to armor the crossing for erosion and scour. Signage has been placed at the north and south termini of the new crossing to direct vehicles away from the bridge and into the one-lane crossing. Lighted barricades delineate the one-lane crossing's travel way.

Site 117 – Photo 7, looking south at Arizona crossing, timber bridge with K-rail closure at right.

Site 117 – Photo 8, Looking west. Rip-rap on creek entry point to 24-inch pipes in temporary crossing over Browns creek. Burned timber bridge is behind the temporary crossing in this photo.

Recommendation

The existing timber bridge needs to be removed and replaced. The temporary supports will constrict creek flow and eventually settle. The structure is a danger to trespassing pedestrians and animals. A study needs to be performed to determine the optimum design for the new bridge. The new bridge should be designed for ease of maintenance in this remote area, and of sufficient freeboard to allow for 100-year rainfall flows. A 24-foot roadway width should be considered as a minimum, with guardrail and handrail on both sides. As seen in the results of the current fire, the new bridge should be designed with fire resistance in mind.

Temporary Crossing

Since it is not currently know how long the temporary crossing will need to be utilized and it is the only access to the community and park on the north side of the bridge, the following are additional measures that should be taken to extend is longevity:
It is highly recommended to add an additional 24-inch minimum diameter pipe below the travel way. The current pipes are slightly short at the exit embankment and could cause an eddy to form, which would scour and possibly erode the soil at the bottom of the embankment. Additional rip-rap and or gunnite should be used along both embankment sides to prevent erosion. The travel way portion of the surface should be paved to add longevity and armature should the crossing be overtopped by the creek.

A maintenance and inspection program should be set-up to inspect the crossing after rain events and provide timely repairs as needed.

Site No. 138 – Browns Canyon Concrete Bridge and Debris Basin (Thomas Guide Map pg 480, grid B7)

Site Setting

Browns Canyon in the area of the bridge is a local residential asphalt paved roadway traversing north and south. The bridge is the only access to the community of 5 ranches, horse-boarding operations and a park. This concrete bridge is located just south of the timber bridge discussed above. The debris basin is located to the southwest of the bridge structure and captures the flow that goes under the bridge.

Thomas Brothers Maps, Thomas Guide, shows the area as Browns Creek Park. The roadway in the area of the bridge is approximately 25 feet in width and with a slight upgrade at the north end of the bridge. Access to the area is from De Soto Boulevard traveling north from the 118 Freeway, in the Porter Ranch area of the City of Los Angeles and intersecting portions of the unincorporated portions of the County of Los Angeles. It was not clear at the time of our assessment if the bridge was in City of LA, County of LA, or private right-of-way. This Bridge is open to through traffic. Traffic on the bridge during the assessment was observed to be 20-60 vehicles per hour, with additional pedestrian and equestrian crossings.

Existing Condition

The bridge is a reinforced concrete slab structure with an asphalt overlay wearing surface on the travel way. The bridge has 5-inch curbs along the edge of travel way. The Bridge is 55 feet in length and 23-feet in width. The bridge has two concrete retaining wall style abutments, and two concrete bents (3-barrel bridge) with concrete along the bottom of each barrel. On either side of the bridge is a drop of approximately 3-4 feet to a sandy creek bed. The perennial creek had low flow at the time of this investigation, but has had flows over the travel way according to the residents. Currently the bridge does not have guardrail or hand rail along the edge of travel way of the bridge (see Photo 1 below).

Site 138 – Photo 1, Looking southeast, reinforced concrete slab bridge. Debris in 2 of 3 barrels.

Damage Assessment

The bridge structure does not appear to be damaged as a result of the fire. Some cracking of the concrete structure is evident near the bridge and wingwall joint at the south west corner. Since two of the three barrels of the bridge were full, a complete visual inspection was not possible, but the bridge structure appears to be in satisfactory condition and performing. Travel way markers on the bridge are bent back thereby not delineating the edge of travel way on the bridge at night. Debris is blocking two of the three barrels of the bridge.

Recommendations

The debris built up in the barrels of the bridge structure needs to be carefully removed. This action can be performed in combination with the clearing of the debris basin on the west side of the bridge. A canal should be established to allow the flow to continue to the natural creek channel along the toe of the slope of the hillside to the west.

Reflector delineators and or a guardrail should be installed for safety to delineate the travel way. The cracks in the concrete structure need to be cleaned out and evaluated by a bridge engineer. The cracks should be sealed in order to protect the inner core of the bridge from water and plant intrusion.

Site 138 – Photo 2, View looking east into barrel of bridge structure.

Site No. 119 – Browns Canyon Sediment Disposal Site (Thomas Guide Map pg 500, grid B2)

Site Setting and Existing Condition

Browns Canyon Sediment Disposal Site is located in the Chatsworth area of the City of Los Angeles, in Los Angeles County. The basin is bordered by Desoto Avenue and Browns Canyon to the east, the 118 Freeway to the south, Sierra Canyon Way to the west and Browns Creek Park to the north. The debris basis accepts flows from multiple canyons to the north and expels storm water into Browns Canyon wash to south.

The debris basin has a 60-foot tall, concrete capped spillway running east to west across the debris basin. Hiking trails/maintenance roads along the east and west sides lead into the debris basin.

Damage Assessment

Other than burned trees and other organic material, to be discussed by others, the debris basin suffered little damage as a result of the fire. The fire burned hand rails and log retaining structures supporting the east trail entry into the debris basin from Desoto Avenue. A portion of the concrete spillway has broken away and will eventually, especially with the increased flows as a result of the fire, cause a large rut and compromise the remaining structure of the spillway (see Photo 1). The top soil at the edge of the spillway is already undermined and is dangerous to hikers.

Site No. 119 – Photo 1, Damaged concrete spillway

Recommendations

The debris basin needs to be cleaned and prepared for the additional debris flows possible this year as a result of the fire in the canyons tributary to the basin. The concrete spillway needs to be repaired to prevent further erosion and damage to the facility. This will require removal of debris and the broken portion of the spillway. The running perennial creek should then be rerouted to run over the spillway again. The hiking trails leading into the basin need to be evaluated for slope stability in the locations of the burned retaining structures. Simple fixes like bulkhead style retaining walls or pipe and board can replace the burned structures. Hand rails should be provided in locations with steep slope drops along the trails.

Site No. 132 – 19066 Kilfinan Place (Thomas Guide Map pg 480, grid G6)

Site Setting and Existing Condition

19066 Kilfinan Place is a burned residence, located in the Porter Ranch area of the City of Los Angeles, in Los Angeles County.

Site No. 132, Photo 1, Burned residence located at 19066 Kilfinan Place

Damage Assessment

The residence appears to be a total loss. Because the area was fenced off and on private property a structural assessment was not performed.

Recommendations

The residence appears to be well fenced, but, should be demolished or restored within the near future. Burned buildings bring blight to a neighborhood and can be dangerous to trespassers and surrounding structures because of their weakened state.

Fifteen burned residences were reported in this fire event. The local governing agency should review the structures and their surroundings for safety as noted above.

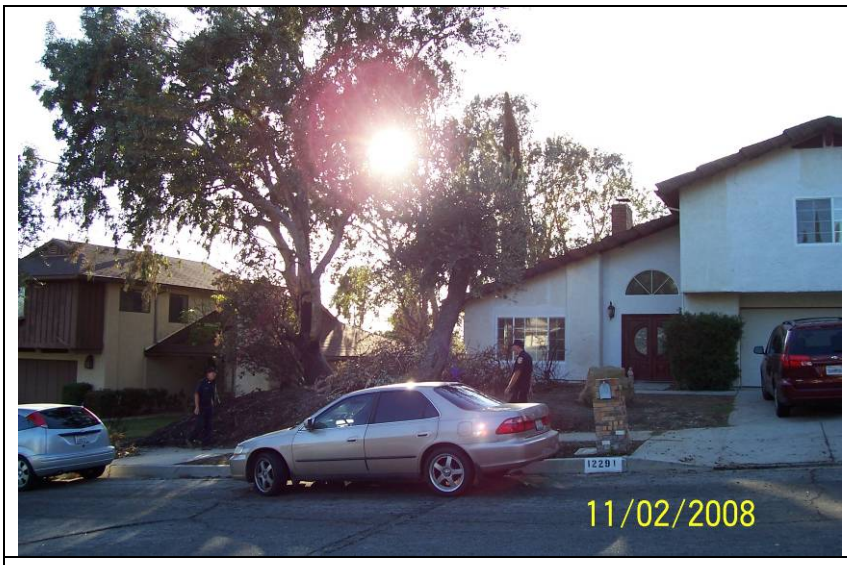
Site No. 141 – 12291 Derwent Avenue (Thomas Guide Map pg 480, grid G6)

Site Setting and Existing Condition

12299 Derwent Avenue is a fire-damaged residence, located in the Porter Ranch area of the City of Los Angeles, in Los Angeles County.

Damage Assessment

This residence sustained minor damage as a result of a burning tree between this residence and its neighbor to the south.



Site No. 141 – Photo 1, burned trees adjacent to residence located at 12291 Derwent Avenue

Recommendations

An arborist should be consulted on the health of the burned trees between the homes. Damage to residential structures and possible injury to inhabitants is very possible should the tree fall during high winds or a seismic event. For these reasons, it is generally recommended that trees not be planted closer than 15' from a building and that tree canopies, especially heavier limbs, not be allowed to grow over the structure.

Closure

If there are any questions regarding this report, please contact Alexander Reyman at (213) 847-0470 or Bing Wu at (213) 897-0874.

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DRAFT TECHNICAL SPECIALIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

Resource: Wildlife

Fire Name: SESNON FIRE CA-LAC-08231953 November 2008

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I. Resource Condition Assessment

A. Resource Setting

The 14,703-acre Sesnon Fire burned five drainages (Aliso, Limekiln, Browns, Devil's and Las Llajas Canyons) within the Santa Susana Mountains. Habitats affected by the burn include chaparral (5,126 acres), coastal sage scrub (5,597 acres), oak woodlands/hardwood forests (1,623 acres), native and non-native grasslands (1,673 acres), riparian (260 acres), and 424 acres of miscellaneous (eucalyptus, barren, urban). Coastal sage scrub and chaparral habitats (chamise-redshank chaparral, mixed chaparral) dominate this landscape, which is interspersed with native and non-native grasslands, and coastal oak woodlands. Valley oak woodlands and montane hardwoods dot the higher elevations, and riparian habitats occur in lower-elevation drainages. Habitats within the fire perimeter burned at predominantly low to moderate severity. Although areas of high severity were observed in most drainages, the broadest expanse of habitat that consistently burned with high and moderate severity occurred between Brown's and Mormon Canyon.

A sizeable portion of the burn area falls within the Santa Susana wildlife corridor (see Appendix, Figure 10). This is one of the few remaining areas that provides connectivity between the coast and inland mountain ranges, which is an essential element for preserving the natural ecological and evolutional processes on a fragmented landscape (Penrod et al 2006).

B. Survey Methods

The California Natural Diversity Database (CNDDB 2008) was queried for occurrences of sensitive species within and immediately adjacent to the fire perimeter. Ecologists familiar with this landscape were consulted and literature were reviewed for potential occurrences of sensitive species that have not yet been documented in the CNDDB. GIS maps of pre-fire vegetation type and species occurrences were created from resulting data

layers. Additional maps provided by the California Governor's Office of Emergency Services (OES) and Cal Fire included fire severity (LANDSAT satellite image), fire suppression lines, fire history, and pre-fire habitat data. In addition to CNDDB occurrences and map analysis, site visits to assess impacts to wildlife resources and habitat were conducted. Accuracy of the fire burn-severity map was determined by comparing field observations and soil hydrophobicity tests against the severities depicted on the map.

II. Findings of the On-The-Ground Survey

A. Identify Values at Risk (Post-Fire)

This report assesses the effects of the Sesnon Fire and those proposed by the SEAT to state and federally listed endangered or threatened species, state species of concern, and sensitive "focal species" of the Santa Susana wildlife corridor.

Table 1 is a list of sensitive species potentially at risk with CNDDB occurrences within the fire perimeter. Species observed during the SEAT assessment are also included. Specific treatments will focus on those values immediately at risk.

Table 2 is a list of sensitive wildlife with suitable pre-fire habitat within the burn and occurrences documented in literature, or with CNDDB occurrences adjacent to the burn. A complete list of sensitive species potentially at risk is not the focus of this report; however, resident native and sensitive species not specifically discussed will receive benefits from the recommended treatments.

Table 1. Values at Risk within the fire perimeter

Common Name	**Scientific Name**	**Status**
western spadefoot toad	*Spea hammondii*	State Species of Concern
coast range newt	*Taricha torosa torosa*	State Species of Concern
coast (San Diego) horned lizard	*Phrynosoma coronatum blainvillii*	Federal Threatened State Species of Concern
two-striped garter snake	*Thamnophis hammondii*	State Species of Concern
Golden eagle	*Aquila chrysaetos*	State Species of Concern
western mastiff bat	*Eumops perotis californicus*	State Species of Concern

Table 2. Potential values at risk immediately adjacent to fire perimeter

Common Name	**Scientific Name**	**Status**
monarch butterfly	*Danaus plexippus*	State Ranked S3
arroyo toad	*Bufo californicus*	Federal Endangered
silvery legless lizard	*Anniella pulchra pulchra*	State Species of Concern
southwestern pond turtle	*Actinemys marmorata pallida*	State Species of Concern
tricolored black bird	*Agelaius tricolor*	State Species of Concern
rufous-crowned sparrow	*Aimophila ruficeps canescens*	State Ranked S2/S3
burrowing owl	*Athene cunicularia*	State Species of Concern
San Diego desert woodrat	*Neotoma lepida intermedia*	State Species of Concern
American badger	*Taxidea taxus*	State Species of Concern; Focal Species of Santa Susana wildlife corridor

B. Condition of Values at Risk

1. Habitat types

Fires affect wildlife primarily through changes in habitat. Although individuals may have perished during the fire event, most wildlife populations should re-colonize the area as habitat recovers. A significant portion of this landscape burned at low to moderate intensities, and patches of habitat remained unburned. In some areas, resident native wildlife should receive benefits from the fire. However, portions of this fire-adapted system are at risk of degradation or outright loss because of numerous recent fire events. Frequent fires reduce seed stock for certain native species allowing fast-growing non-native grasses to become established, which are often more susceptible to fire than the native vegetation (Brooks 2004; Smith 2000). This is particularly true for areas that were recently burned in 1992 (Farralone Fire), 1993 (Chatsworth Fire), 2003 (Simi Fire), and 2005 (Topanga Fire) [See Appendix, Figure 12]. Such habitat losses can potentially place sensitive species at risk from long-term displacement or local extirpation.

Riparian communities face similar risks through invasion of non-native invasive plants. Giant reed, commonly known by its genus name Arundo, has been cited as a major threat to riparian habitats in southern California (FEIS). Arundo efficiently out-competes native plant species, provides negligible habitat and nutritional values for wildlife, and alters ecosystem processes such as water quality and fire regime. Because their rhizomes grow close to the surface, stands of Arundo can be dislodged during heavy rain events, which can increase the risk to human life and property by blocking drainage channels and culverts. Large stands of Arundo also increase the risk of wildfire in an already fire-prone environment. Prompt removal and monitoring of Arundo stands is a necessary

action to reduce threats to safety and property damage from fire and flooding, and for maintaining healthy riparian communities.
Wildlife corridors are critical features of the landscape, connecting areas of habitat fragmented by urban development. Facilitating dispersal of wildlife between patches of remaining habitat is critical for maintaining rich biodiversity in this region (Penrod et al. 2006). Sensitive focal species of the South Coast Wildlands Project (such as the American badger) are potentially at risk if suitable habitat is unavailable, or if sediment flows from the burn area prevent movement within the Santa Susana corridor.

Upland Habitats

Upland habitats (annual grasslands, coastal sage scrub, chaparral, oak woodlands and hardwood forests) to the west of Brown's Canyon and to the east of Mormon Canyon generally burned in an irregular mosaic pattern with low to moderate intensities. Some chaparral-oak woodland communities in Las Llajas and Blind Canyons burned moderately, with some areas of higher intensity. The greatest impact occurred between Brown's and Mormon Canyon, where a significant portion burned at high intensities. The lower-elevation chamise-redshank chaparral community was particularly hard-hit. Livestock grazing occurring in some of these areas could affect recovery of the natural habitat through disturbance and distribution of non-native plant species.

Riparian Habitats

In general, burn patterns were low intensity and patchy within riparian habitats. Brown's Canyon contained substantial areas of light to moderate intensities, with one riparian community in Aliso Canyon sustaining high intensity burns.

2. Wildlife Resources at Risk

Upland species

Direct mortality to individuals is an immediate impact of fire. Many animals avoid the initial event by fleeing or burrowing underground, while others succumb to toxic effects of smoke and ash. Wildlife habitat recovery is determined by burn intensity and pattern, as well as post-fire impacts such as drought and disturbance.

Coastal sage scrub habitats recover quickly from fire, often within five years (FEIS website). Bird species associated with this plant community are expected to re-establish populations within areas of suitable post-fire habitat. Golden eagles respond well to fire, and are often attracted to disturbed sites in search of prey (CWHRS 2008); however, rodent-prey may have been impacted where burn severity was high (such as Mormon Canyon). Recovery of forage habitat for small mammals and rodents will affect the persistence of golden eagle in this area. Western mastiff bat occurs in the southwestern-most flank of the fire perimeter where frequent burns have occurred (1992, 1993, and 2005). Little is written about responses of molossid bat species to fire, and it is unknown if the potential for habitat conversion will have an impact upon this population, or upon

their insect prey-base. If adequate cover and forage is available, western mastiff bat should continue to utilize this area.

Upland herpetofauna may sustain the greatest impacts from this fire. The coast horned lizard is federally listed, as endangered, and as a state species of concern (CNDDB 2008). Populations in this region inhabit sandy washes within chaparral and coastal sage scrub communities. Because they have specific habitat and foraging requirements, they are not as adaptable to modified habitats as other reptilian species (CWHRS 2008; Jennings and Hayes 1994). The coast horned lizard occurs in Devil and Ybarra Canyon (CNDDB 2008). These areas burned at low to moderate intensity, but higher intensities occurred upstream. Sedimentation and debris flow could result in habitat degradation or loss, and possible extirpation of this species from the area.

The western spadefoot toad is a state species of concern, with one occurrence in the fire perimeter (CNDDB 2008). It is expected that direct mortalities related to the fire were low, as western spadefoot are thought to be relatively inactive in underground burrows for most of the year, emerging only after the first autumn rainfall (CWHRS 2008, Jennings and Hays 1994). Vernal pools with specific temperature and persistence attributes are essential for successful breeding and recruitment. A vernal pool near the CNDDB occurrence is located in a city-owned park on the eastern edge of the fire perimeter. An internet search revealed that this park is very popular with local residents and mountain bikers, and high use of this area were observed during our assessment. Although human disturbance is a pre-existing condition, fire exacerbated the fragile nature of this habitat. In addition, fire suppression lines surrounding the vernal pool leave it vulnerable to substantial sediment and debris deposits, which could alter its suitability for western spadefoot. This could potentially result in extirpation of this species, and others associated with this vernal pool community.

Riparian Species

Riparian habitats were not severely impacted by fire, and it is anticipated that the majority of wildlife species will re-colonize these zones as habitat recovers. Although there were no CNDDB occurrences of coast range newt within the fire perimeter, several individuals were collected in Limekiln Canyon during an effort to remove sediment from the creek. (Mikael Romich, pers. comm.). Habitat here burned at low intensities, so direct impacts to this state species of concern were minimal. However, potentially heavy sediment and debris-flow from moderately burned upstream slopes may impact this habitat, leaving coast range newt vulnerable to long-term displacement or extirpation.

Two-striped garter snake, a state species of concern, has one occurrence within the fire perimeter. A literature search revealed this species is extirpated from nearly 40% of its historical range. (Jennings and Hayes 1994). This semi-aquatic snake requires riparian areas with permanent to semi-permanent bodies of water. Unlike most snakes, young do not hatch from eggs, but are live-born during late summer. Individuals may have escaped the fire by retreating into moist, underground burrows (CWHRS 2008), but the potential

for heavy upstream debris-flow and sediment deposits may put this population at risk of extirpation.

III. Emergency Determination

The Sesnon fire was generally a low to moderate severity burn in an irregular mosaic. However, areas burned at higher intensities are associated with major drainages. Extensive post-fire sedimentation potentially affects down-stream habitats. In addition, habitats impacted by frequent fires are at risk of type-conversion, which may reduce the possibility of full recovery to pre-fire habitat condition. Several species may be at risk from long-term displacement or extirpation.

IV. Treatments to Mitigate the Emergency

The focus of the Sesnon Fire SEAT was based upon the following values at risk: 1) human life and safety, 2) property, and 3) natural and cultural resources. To that end, highest priority should be placed upon treatments that reduce risk to human life and property. This includes, but is not limited to the restoration of habitats at risk of type-conversion (which increases fire frequency), and removal of non-native invasive plants such as Arundo. Second priority should be placed upon restoration of habitat and monitoring of sensitive species that are at risk of long-term displacement or extirpation from the area. These treatments include, but are not limited to those listed below:

A. Treatment Type

1. Specific Recommendations

- Vernal Pool – rehabilitate fire suppression lines in the immediate vicinity of the pool. Restrict public access to the burned area.
- Sulpher Spring Fire Road – divert flow from the natural spring under the existing road with appropriately sized pipes so as not to increase the rate of natural flow (see also site number 102 in the Civil Engineer Specialist Report).
- Brown's Canyon Bridge – interagency coordination is essential to monitor the potential impacts of a temporary Arizona-crossing installed because of the Civil Engineer's unsound bridge determination. (Refer to site number 117 in the Civil Engineer, Geology, and Hydrology Specialists Reports)
- Minimize the amount of vegetation removed while clearing chokepoints in channels to only that essential for reducing risks to life and property. Vegetation smaller than 3 inches in diameter should remain in the channel, and only the actual channel be cleared (unless a threat to life and property exists upslope of the channel). This recommendation includes, but is not limited to the following sites proposed in the Geology and Hydrology Specialists reports: 111, 112, 113, 119, 129, 136 and 138.

2. General Recommendations

- Implement appropriate BMPs upstream of sensitive riparian habitats to minimize sediment load.
- Conduct post-fire surveys in riparian zones to detect and immediately eradicate non-native species (e.g. arundo).
- Conduct re-vegetation efforts where appropriate to promote rapid recovery of native habitats.
- Conduct post-fire surveys to assess wildlife populations and habitat recovery.
- Conduct long-term monitoring of key species to document population trends.
- Avoid livestock grazing in burned areas until at least the 2009-2010 growing season, and longer if rainfall is below the long-term average in the year following the fire.
- Coordinate with local agency representatives prior to and during maintenance activities to avoid, minimize, and mitigate additional impacts to species, particularly along riparian zones.

B. Treatment Objective

The treatments' objectives are to monitor wildlife populations and encourage adaptive management of sensitive wildlife species.

C. Treatment Description

<u>Erosion Control</u>

- Oak slash should remain in place wherever feasible.

- Conduct surveys prior to any work in Devil, Ybarra, Brown and Limekiln Canyons, to detect presence of sensitive herpetofauna mentioned in this report.

- Stabilize slopes between 20 and 50 percent, where feasible, with biodegradable matting to limit slope erosion while also limiting impacts to recovering native vegetation and wildlife habitat.

- Avoid use of hydroseed and hydromulch. Hydromulch and hydroseed are ineffective because of the lack of soil moisture for them to be efficient, they inhibit natural recruitment from the native seed bank, and they introduce exotic weed species into native habitat.

- Avoid removal of vegetation important to sensitive species, especially unburned habitat in known nesting or foraging territories.

- Use appropriately sized culverts as determined by an appropriate agency when replacing or improving drainage structures. Restrict vegetation removal from culverts and drainages to what is necessary for expected flow.

- Avoid disturbing islands of unburned vegetation, which provide wildlife habitat as well as seed sources for natural re-vegetation.

Re-vegetation of Native Habitat

- Re-vegetate riparian habitats in burn areas to encourage habitat re-growth. Riparian vegetation will promote soil stabilization as well as provide refugia for wildlife species.

- Restore and monitor habitats impacted by recent, frequent fires (See appendix, Figure 12), which are at risk of habitat conversion.

Population surveys and long term monitoring

- Conduct long-term bird monitoring for golden eagle, tri-colored black bird, rufous-crowned sparrow and burrowing owl within and adjacent to the burn area to evaluate the likelihood of direct mortality, the extent and duration of displacement, and the rate and extent of habitat recovery.

- Conduct long-term small mammal monitoring throughout the burn area to evaluate mortality rates.

- Conduct long-term monitoring of upland and riparian herpetofauna to evaluate the likelihood of direct mortality, the extent and duration of displacement and the rate and extent of habitat recovery.

- Conduct long-term monitoring of focal species of the Santa Susana wildlife corridor. Evaluate population trends, habitat recovery, and wildlife movement patterns.

- Consult natural resource agencies, including the Department of Fish and Game, U.S. Fish and Wildlife Service, and U.S. Geological Survey regarding protocols and season of wildlife surveys.

- Document unburned habitat and monitor for use of sensitive species.

Local Agency Coordination

- Local agencies and jurisdictions should coordinate activities with the above-mentioned natural resource agencies to avoid, minimize, and mitigate impacts to sensitive species during post-fire recovery efforts.

- Coordinate local jurisdiction and private landowner activities within riparian areas and sensitive species' habitat to address wetland permitting (including, but not limited to Department of Fish and Game, Regional Water Quality Control Board, and U.S. Army Corps of Engineers).

- Consult natural resource agencies, including the Department of Fish and Game and U.S. Fish and Wildlife Service regarding the suite of species, appropriate vegetation protocols, and season for re-vegetation efforts.

- Recommend the above-mentioned government and non-government groups mutually staff and participate on a Sesnon Fire recovery and remediation team, upon completion of the SEAT assessment. This will facilitate coordination, timeliness and environmental sensitivity of current and future projects proposed for the burned area's watershed.

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The Santa Susana Pass Wildlife Corridor data-layer were used with permission from the South Coast Wildlands Project. www.scwildlands.org

DRAFT TECHNICAL SPECIALIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

Resource: Botany

Fire Name: SESNON FIRE CA-LAC-08231953 November 2008

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I. Resource Condition Assessment

A. Setting

The 14,703 acre Sesnon fire started on October 13, 2008 and was fully contained on October 18, 2008. The burn area is located in both the Santa Susana Mountains and Simi Hills, which are part of the east-west trending transverse ranges in southern California. Burn area elevations span from 3,747 feet at Oat Mountain Peak, to around 1000 feet in the Santa Susana Pass State Historic Park.

The Sesnon fire burned 23 separate vegetation types (Table 1) on a combination of Federal, State, County, and private lands in Los Angeles and Ventura Counties from the Simi Hills in the south, to the southern edge of the Santa Clara valley. These 23 vegetation types represent 5 major categories: shrubland (67% of the area within the fire perimeter), hardwood forest/woodland (12%), conifer forest/woodland (<1%), grassland (14%), and Urban/Bare Rock (7%) (Appendix A). This report will focus on impacts to vegetation and rare, threatened, and endangered plant species on State Responsibility Lands (State, County, local, and Private ownership), which account for approximately 14,703 burned acres, as well as additional areas impacted outside the fire perimeter on State Responsibility Lands (acreage unknown). Botanical values at risk from contingency dozer lines constructed outside the actual burn perimeter on State Responsibility Lands are also included in this report.

Table 1 Vegetation Communities within the Fire Impact Zone

Alias	PERCENTAGE	ACREAGE
Annual Grasses and Forbs	13.76%	2022.98
Barren/Rock	0.13%	19.16
Bigcone Douglas-Fir	0.17%	25.15
Black Walnut	0.15%	22.74
California Sagebrush	20.34%	2990.74
Ceanothus Chaparral	3.23%	474.96
Chamise	1.03%	150.85
Coast Live Oak	8.81%	1295.76
Coastal Cactus	0.05%	7.49
Coastal Mixed Hardwood	0.73%	107.51
Lower Montane Mixed Chaparral	26.51%	3897.82
Non-Native/Ornamental Conifer/Hardwood Mixture	0.15%	22.11
Non-Native/Ornamental Grass	0.05%	7.99
Non-Native/Ornamental Hardwood	0.31%	45.96
Nurseries	0.00%	0.33
Pastures and Crop Agriculture	0.02%	2.55
Riparian Mixed Hardwoods	1.36%	200.30
Riparian Mixed Shrub	0.15%	21.83
Scrub Oak	0.09%	12.85
Sumac Shrub	15.28%	2245.67
Urban	4.37%	641.83
Urban - related Bare Soil	2.97%	437.03
Valley Oak	0.33%	47.79

B. Survey Methods

Rare plant and natural community locations from the California Natural Diversity Data Base (CNDDB, 2008) were overlain with dozer lines and draft fire burn severity data to identify potential areas of impact from fire suppression and repair activities, as well as impacts to species/natural communities from high and moderate severity burns (accurate Burn Area Reflectance Classification maps were not available for SEAT team review on this fire). Based on this analysis, certain plant populations/communities were identified as possibly being disturbed during the fire, subject to high intensity burn, or potentially subject to disturbance during post-burn treatments and after-effects. Field visits were conducted on October 28, 29, 30, 31, November 3, 4, and 5, 2008 to assess potential impacts to sensitive natural communities and rare plant populations that were likely to be visible in October. All dozer tracks were inspected, and areas that experienced moderate to high burn severity were surveyed. Included in the fire impact analysis were burned areas, unburned areas directly impacted by fire suppression activities, and downstream areas potentially affected by sediment flow and flooding. Potential impacts to rare plants that were in inconspicuous phases of their life cycle, did not have detailed location information, or were in inaccessible areas, were inferred from the map exercise and personal communications with local experts.

II. Findings of the On-The-Ground Survey (Observations)

A. Identify Values at Risk

Thirteen rare plant species and seven sensitive plant communities have been reported to occur in the region of the Sesnon fire area, although six of them are not known from State Responsibility Lands (Table 2). Listed and rare plant species within the fire disturbance perimeter include Plummers' mariposa lily, San Fernando Valley spineflower, Santa Susana tarplant, slender-horned spineflower, Palmer's grapplinghook, Davidson's bush mallow, and California orcutt grass. Sensitive vegetation communities within the fire disturbance perimeter include California walnut woodland, vernal pool, southern coast live oak riparian forest, southern cottonwood willow riparian forest, southern mixed riparian forest, southern sycamore alder riparian woodland, and valley oak woodland.

Table 2. Rare, Threatened and Endangered Plants Potentially in the Sesnon Fire Impact Area

Scientific Name	Common Name	Location within Fire	Status
Astragalus brauntonii	Braunton's milk-vetch	Not Documented within burn impact area, however suitable habitat exists	FE
Berberis nevinii	Nevin's barberry	Not Documented within burn impact area, however suitable habitat exists	FE, SE
California macrophylla	round-leaved filaree	Not Documented within burn impact area, however suitable habitat exists	1B.1
Calochortus clavatus var. gracilis	slender mariposa-lily	Not Documented within burn impact area, however suitable habitat exists	1B.2
Calochortus plummerae	Plummer's mariposa lily	Above and below Hwy 118 at the LA-Ventura County Line, N. from the ridgeline of Oat Mtn., from Bee Cyn. to the east to Sulpher Cyn on the west, Marr Ranch/Chivo Cyn. Area (dozer lines), Santa Susana SHP	1B.2
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	Santa Susana Pass State Historic Park (SHP) and vicinity	FC, SE
Deinandra minthornii	Santa Susana tarplant	Rocky Peak, Santa Susana Pass SHP	SR, 1B.2
Dodecahema leptoceras	slender-horned spineflower	N. from the ridgeline of Oat Mtn., from Bee Cyn. to the east to Sulpher Cyn on the west	FE, SE
Dudleya blochmaniae ssp. blochmaniae	Blochman's dudleya	Mapped near Chatsworth Reservoir, not Documented within burn impact area, however suitable habitat exists	1B.1
Dudleya multicaulis	many-stemmed dudleya	Rocky outcrops in burn area may have suitable habitat, reported from south of burn area at Chatsworth Reservoir	1B.2
Harpagonella palmeri	Palmer's grapplinghook	N. from the ridgeline of Oat Mtn., from Bee Cyn. to the east to Sulpher Cyn on the west	4.2
Malacothamnus davidsonii	Davidson's bush-mallow	Known from an ephemeral wash north of Limekiln Cyn	1B.2
Orcuttia californica	California Orcutt grass	N. from the ridgeline of Oat Mtn., from Bee Cyn. to the east to Sulpher Cyn on the west	FE, SE
California Walnut Woodland	California Walnut Woodland	Upper Aliso Cyn., east flank of Oat Mtn. by Mission Point, Oat Mtn. at lookout	N/A
Vernal Pool	Vernal Pool	Oat Mtn. by Mission Point, O'Melvany Park	N/A
Southern Coast Live Oak Riparian Forest	Southern Coast Live Oak Riparian Forest	Bee Cyn., E. Fork of Devils Cyn, upper Chivo Cyn., Las Llajas Cyn., Cyn. east of White Oaks Park	N/A
Southern Cottonwood Willow Riparian Forest	Southern Cottonwood Willow Riparian Forest	Limekiln Canyon	N/A
Southern Mixed Riparian Forest	Southern Mixed Riparian Forest	Blind Cyn., Devils Cyn., Mormon Cyn., Browns Cyn., El Toro Cyn., Sulphur Cyn.	N/A
Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	Aliso Canyon	N/A
Valley Oak Woodland	Valley Oak Woodland	Flannigan Street near Hummingbird Ranch Development, N. from the ridgeline of Oat Mtn., from Bee Cyn. to the east to Sulpher Cyn on the wes	N/A

FE= Federally Endangered, FC= Federal Candidate, SE= State Endangered, SR= State Rare
California Native Plant Society (2008) Lists:

1B= rare, threatened, endangered in California and elsewhere
2= rare, threatened, or endangered in California, but more common elsewhere
4= limited distribution (watch list)
0.1= seriously endangered in California
0.2= fairly endangered in California
0.3= not very endangered in California

The ecological integrity of natural communities in the Sesnon fire impact area is a value at risk because disturbance can allow encroachment of invasive weeds. Weeds compete with native plants for moisture, nutrients, and sunlight; alter vegetation structure, which can create unsuitable habitat for native wildlife; and can contribute to an unnaturally high fire frequency, that may result in type-conversion (permanent changes in vegetation type and species composition). Seven vegetation types within the fire perimeter are of particular concern because they are considered rare natural communities (CNDDB, 2003): California walnut woodland, vernal pool, S. coast live oak riparian forest, S. cottonwood willow riparian forest, S. mixed riparian forest, S. sycamore alder riparian woodland, and valley oak woodland.

B. Condition of Values at Risk

Possible hazards to rare plants, sensitive natural communities, dozer lines, post-fire human management activity, or potential post-burn emergency treatments were identified on State Responsibility Lands in the following areas:

- Vernal pool habitat near O'Melveny Park – not burned, but dozer lines adjacent to pool on hill may cause erosion to deposits in the pool
- Dozer line along Oat Mountain ridge
- Grazing within burn area, especially Las Llajas Canyon
- Heavily burned riparian area throughout Browns Canyon and Mormon Canyon
- Valley oak woodlands that have been repeatedly burned on Oak Mountain ridgeline from the Doppler station east, as well as smaller valley oak woodlands near Hummingbird Ranch (Flanagan Street), Ybarra Canyon, and Rocky Peak Motorway, with non-native annual grasses dominating the understory.

Much of the Sesnon burn area was a low to moderate intensity burn, leaving patches of intact, unburned habitat throughout the burn area. However, this area has experienced multiple fires with very short recurrence intervals which may eventually affect the native seed bank as crown sprouting shrubs may be repeatedly burned before they can set seed. Santa Susana Mountains below Highway 118 burned in the 1993 Chatsworth fire, the southern portion of Rocky Peak burned in the 2005 Topanga fire (see Figure 12), from Devils Canyon Creek west-the entire Sesnon fire boundary burned in the 2003 Simi fire, and two smaller fires (2007 Sesnon and 1994 Porter Ranch) burned areas within the Sesnon perimeter. Most of these rare plants, sensitive vegetation communities, and the chaparral community in general are adapted to wildfires. In fact, seeds of many chaparral

plants require stimulation by fire or smoke before they can germinate (Keeley and Foteringham 1998). Studies have shown native vegetation recovers rapidly after fires without any further treatment (Keeley, 1977; California Native Plant Society [CNPS], 1995). Research has shown that California walnut trees, coast live oaks, and valley oaks respond favorably post fire. Coast live oak associates in riparian areas with alder, sycamore, and cottonwood, which all resprout post fire (Steinberg, 2002). Coast live oak trees less than 3 inches in diameter can be top killed by low to moderate intensity fires, whereas mature trees can survive high intensity fires with crown fire (Steinberg, 2002). Walnut trees have demonstrated good recovery post fire, even when top killed, due to the morphology of having large woody platforms at the soil surface which protect the growing tissue from fire and allow resprouting around the platforms (Esser, 1993). Valley oaks may be favored by fires that keep shrubs from encroaching, keeping the oak grassland association as botanists believe valley oak woodland historically burned on an annual basis. Valley oaks that experience basil burning are most likely to suffer mortality, and crown burning results in a higher mortality of all age classes, and larger valley oak trees (>26.4 inches) reportedly do not produce crown sprouts post fire, but seedlings and saplings that have been top killed can produce root crown sprouts. Valley oak seedlings do not respond well to competition from invasive and exotic annual grasses and forbs, as they out compete valley oaks for a limited supply of soil moisture (Howard, 1992).

The primary concern for all of the rare natural communities inside the fire impact assessment area is damage from human efforts to control debris flows, flooding, and associated hazards in the aftermath of the fire. Trees and shrubs may be cut to avoid debris dams. Native trees will take many years to become established and reach the size of the trees that are cut down, and shading for fish and other aquatic organisms will be reduced in the interim. Conversely, the invasive tree-of-heaven (*Ailanthus altissima*), which grows in floodplains, sends up multiple stump sprouts after the tree is cut down, and Arundo (*Arundo donax*), observed vigorously resprouting 10 days post fire in Browns Canyon Creek, crowd out the young growth of native trees and shrubs.

Heavy equipment operating in stream beds, installing culverts or flood-control structures, while destroying native plants and wildlife habitat in the process, is another potential concern. In fact, the greatest threat to all natural communities from the Sesnon Fire is related to human-caused disturbance. Various treatments that have been used in the past in an attempt to stabilize soil and suppress weeds have failed to achieve the desired objectives, and instead made matters worse by inhibiting the recolonization and growth of native plants. Even thin layers of mulch (such as those from hydromulch) can inhibit natural recruitment from the native seed bank, and hydromulch and hyroseeding are ineffective without high soil moisture. Moreover, various types of mulches and seed mixes may contain invasive weed seeds as contaminants (CNPS, 1995). Wood fiber is less likely than straw mulch to introduce seeds of invasive weeds but can change the soil pH and thereby, the species composition. Introduction of nonlocal “native” seed may compromise the adaptive ability of remaining native plants by hybridizing. Seeding also changes species composition within a habitat type, thereby affecting its suitability for local wildlife (Keeler-Wolf, 1995).

Dozer lines may have directly disturbed rare plant populations along the ridgeline of Oat Mountain, from roughly Browns Canyon along the ridgeline to Mission Point (slender-horned spineflower, Palmers grapplinghook, Plummers mariposa lily, orcutt grass, California walnut woodland ,southern California coast live oak riparian forest, and valley oak woodland) (Figure 1). A second location where dozer lines may have disturbed rare plant populations include a dozer line that runs across part of Rocky Peak, behind the Hummingbird Ranch development (Santa Susana tarplant) (Figure 2) and a third fire suppression repair line that aligns with Highway 118 (Santa Susana Tarplant) (Figure 3). Dozer lines may invite off-highway vehicle trespass if they cross existing roads. Contingency lines (dozer lines constructed outside the fire boundary as a preventative measure) were constructed in Las Llajas and Chivo Canyons, near White Oaks park, Rocky Peak Park, O'Melveny park, and the Santa Susana State Historic Park. The ecological integrity of rare natural communities and rare plant habitats in and near the burned area may be compromised by invasive weed encroachment, particularly along dozer lines which give hikers, bikers, off-road vehicles, and livestock easy access to areas that were once inaccessible. Disturbance of the soil surface tends to favor non-native plants because their seeds typically germinate more quickly than seeds of native plants and then crowd out native species. At least 19 species of invasive weeds occur in and adjacent to the Sesnon fire impact area (Table 3). Thus, there is an existing seed source for invasive weeds to invade burned areas and dozer lines. Heavy equipment such as dozers can easily transport weed seeds that become caught in the machinery or in caked mud. Livestock and wildlife can also transport weed seeds in their fur and their droppings. The area of greatest concern for invasive weed encroachment on State Responsibility lands is the Valley Oak Woodland on Oat Mountain and Rocky Peak which are dominated by non-native annual grasses which have been shown to inhibit natural recruitment of seedlings. Another issue along dozer lines is burial of native annual plant seed bank. Annual plants are those that die each year after setting seed. Populations of annual plants persist from year to year through seeds stored in the soil, which germinate when they are exposed to appropriate temperature and moisture. If the seeds are buried too deep, they may rot before they have an opportunity to germinate, or sprouts may not have sufficient energy to reach the sunlight. Typically, rare annuals and perennials with underground buds recover from wildfires over a period of several years if further disturbance to the burned, habitat is controlled and minimized. Thus, it is important to retain and respread, soil in habitats where native annual plants occur so they can recolonize, and care should be taken to keep soil in the same location so seed from plants that don't currently occupy an area are not introduced into a new area..

Seeding/hydroseeding of the burn area should not be conducted. Studies show that native vegetation recovers rapidly after fires without any further treatment (Keeley, 1977). Introduction of non-local "native" seed may alter or genetically dilute the phenotypes suited for the local ecotype. Seeding may change the dominance of species within a habitat type, thereby altering the density, structure, and function of habitat for local wildlife (food, breeding, cover, etc.) (Keeler-Wolf, 1995). Artificial seeding with any species is not likely to produce significantly better results than allowing natural vegetative recovery (CNPS, 1995).

Table 3. Invasive Weeds Observed In and Adjacent to the Sesnon Fire

Scientific Name	Common Name
Centaurea solstitialis	Yellow Star Thistle
Arundo donax	Giant Reed
Centaurea melitensis	Tocalote (not a Cal-IPPC invasive)
Foeniculum vulgare	Wild Fennel
Erodium cicutarium	Red-stemmed Filaree
Eucalyptus spp.	Eucalyptus
Salsola tragus	Russian Thistle
Schinus molle	Peruvian Pepper
Nicotiana glauca	Tree Tobacco
Ailanthus altissima	Tree of Heaven
Xanthium strumarium	Cocklebur (not a Cal-IPPC invasive)
Washingtonia robusta	Mexican Fan Palm
Cynara cardunculus	Artichoke Thistle
Ricinus communis	Castor Bean
Avena fatua.	Oat
Brassica nigra	Black Mustard
Bromus spp (3 species).	Annual Grasses

III. Emergency Determination

Emergencies to botanical resources related to the Sesnon fire fall into three major categories: 1) Threats to rare plants from the fire itself and from post-fire treatments implemented to protect other values, 2) loss of natural community integrity due to invasive weeds and potential post-fire treatments inhibiting natives, and 3) spread of invasive, exotic weeds into new areas from fire fighting and suppression activities, as well as recreation and grazing.

IV. Treatments to Mitigate the Emergency

A. Treatment Types

• Minimizing intervention and disturbance
• Close all burn areas to public access for a minimum of three growing seasons to facilitate recovery of native vegetation and to prevent renegade trails helping to lessen and minimize erosion.
Close all burn areas to grazing for a minimum of three growing seasons to allow recovery of native vegetation and prevent further spread of invasive weeds and further degradation of native habitat.
• Restoration of endangered species habitat in disturbed and high intensity burn areas. In areas where dozer lines impacted known rare species occurrences, restoration and intensive weed management and monitoring should occur for a

minimum of five years. In areas of high intensity burn severity, monitoring should be undertaken to ensure native seed banks recover in spite of high intensity successive fires. If native seed bank has degraded and fire occurrence outpaces native shrub recovery via crown sprouting to a point where viable seed is not being produced by the crown sprouted shrub prior to the next fire, restoration of shrublands/oak woodlands may be necessary.

• Dozer line remediation.

Restoration of entire length of dozer line, invasive species suppression, and monitoring for a minimum of five years.

• Invasive weed detection surveys and control. Mapping the current and future extent and spread of invasive weeds is recommended as part of a long-term monitoring plan.

Arundo donax was observed sprouting in Browns Canyon Creek near Site 138 (concrete bridge below burned timber bridge on Browns Canyon Road). The highest elevation source for this invasive weed should be identified and targeted as a starting point for an eradication program within the Browns Canyon watershed.

• Monitor vegetation recovery in burned and unburned fire disturbance impact areas (i.e. dozer lines, etc.) to assess long term health or possible decline of sensitive natural communities or rare plant populations.

• Use wash stations to prevent spread of exotic weeds.

Especially important for emergency vehicles, construction contractors and city/county vehicles to prevent weed seeds from spreading to new areas within the fire impact perimeter.

• Control of fill material source.

Fill material for permanent and emergency repairs should come from the local drainage areas as close as possible to the site. This will help to prevent/contain the spread of exotic weeds and help maintain the composition of native vegetation communities that currently exist.

• Preserve natural stream bottoms and size all culverts (bottom-less preferred) to allow for fish/amphibian/reptile/mammal and 100 year flood water movement through culverts. This measure is recommended for both temporary and permanent repairs to streams.

B. Treatment Objectives

Treatment objectives are to protect rare plants and rare natural communities from human-caused disturbance, to promote native plant re-colonization of burned areas and dozer lines, to curtail invasive weed infestations in their incipient stages, and to avoid spreading invasive weeds into currently unoccupied areas.

• Restoration of endangered wildlife habitat
• Minimizing intervention and disturbance
• Dozer line remediation
• Invasive weed detection surveys
• Weed control

• Pre-activity surveys
• Monitoring native vegetation recovery
• Limiting public access to burned areas until vegetation can recover
• Limiting grazing on burned lands until vegetation can recover

V. Recommendations

A. General Recommendations:

• Avoid ground disturbance and herbicide use in areas where rare plant species have been reported. Ground disturbing activities include but are not limited to excavation, contour tilling, scarification, mulching, and driving heavy equipment. If these activities cannot be avoided near known rare plant occurrences, a qualified botanist should conduct pre-activity surveys.
• Propagate plants from the closest possible stands when restoring sensitive wildlife habitat.
• Avoid seeding or tilling wildlands unless necessary to protect life and property. Seeding/hydroseeding of the burn area should not be conducted.
• Mulch should not be used in the fire impact perimeter. If mulching is essential, biodegradable matting such as wood fiber is preferred. Straw is less desirable but should be weed-free if used. Hydroseed and hydromulch are discouraged.
• Restrict chip layers from use of hydro-axes to 1 inch deep or less to avoid inhibiting sprouting from native seeds and root crowns.
• If clearing chokepoints within channels is necessary to reduce risk to life and property, only the minimum amount of vegetation should be cleared that enables this goal to be met. Vegetation smaller than 3” dbh should be left in the channel, and only the bankfull channel should be cleared. Channels should be surveyed for Arundo donax, caster bean, tree tobacco, tree of heaven, and cocklebur prior to any clearing and if found, should be carefully removed in a manner to prevent spread of these weedy species.
• Redistribute soil that was piled into berms or piles during creation of dozer lines to salvage native plant seeds, keeping to the same sub-watershed from where the sediment was collected.
• Block or disguise dozer line entrances with shrubs, logs, or other means to minimize trespass.
• Do not plant or seed invasive species.
• Conduct invasive weed surveys during the 2009-2010 growing seasons along dozer lines and roads used by suppression equipment.
• Promptly control weed populations upon detection, and follow up with monitoring and control for at least 5 years.
• Avoid livestock grazing in burned areas for at least three (3) years (longer if rainfall is below the long-term average in the year following the fire).
• Avoid disturbing islands of unburned vegetation, which provide wildlife habitat and seed sources for natural revegetation.

B. Specific Recommendations

• Conduct rare plant surveys and mapping annually within the burn area to assess long term impacts from frequent fires on sensitive plant recovery, especially non-native grass impacts to valley oak woodlands.
• In Ybarra Canyon, conduct oak regeneration studies to monitor areas where coast live oak woodlands were crown burned, to assess post fire recruitment.
• In Browns and Mormon Canyons, conduct tree regeneration studies to monitor areas where coast live oak, and mixed riparian woodlands suffered extensive crown burning, to assess post fire recruitment.
• Conduct native grassland regeneration studies to assess long term impacts from frequent fires and assess impacts from non-native grass competition. If necessary, a non-native grass removal and restoration program should be undertaken as soon as possible in valley oak woodlands within the fire impact area to help species with future recruitment.
• Monitor long term recovery of cactus sage scrub to ensure recovery of potential coastal cactus wren habitat.
• Conduct annual weed mapping to determine if type conversion from native habitat to weed dominated habitat is occurring. Develop an eradication program for any areas where weeds are inhibiting natural post fire native habitat recovery.
• Mulch should not be applied to open space areas within the burn area. Mulch may introduce weed seed as well as suppress germination and growth of native species.
• Open space recreation areas should be closed to the public for three (3) years to allow vegetation to recover undisturbed.
• If tree-of-heaven must be cut, treat stumps with appropriate herbicide immediately after cutting to prevent regrowth.
• If big cone Douglas fir stands along various canyons on Oat Mountain are found to be burned, monitor for regeneration.

C. Treatment Cost

Costs will not be incurred if seeding, mulching, and similar measures are avoided as recommended. Biological consultants may charge $100 or more per hour to survey for rare plants and weeds. The total cost depends on the amount of ground-disturbing activities in known rare plant habitats, extent of invasive weed spread within the fire area and the weed eradication methods used.

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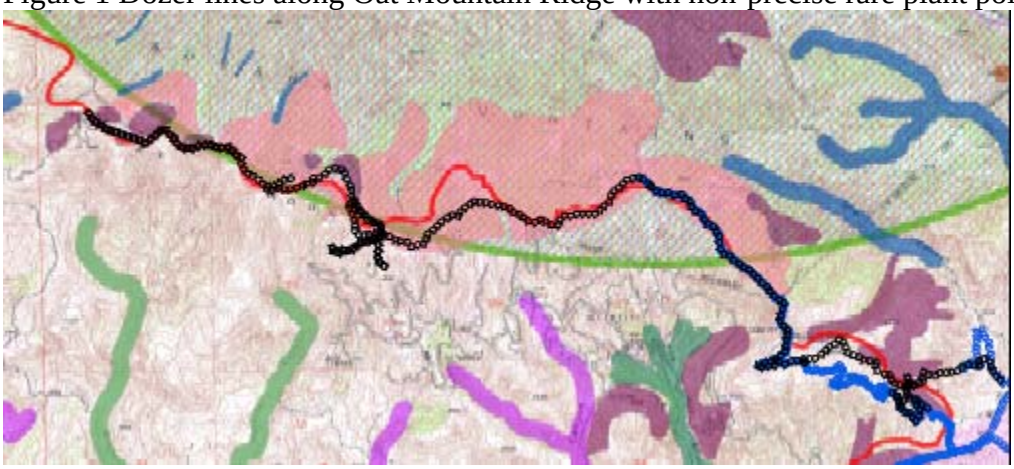
Appendix A

CNDDB List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database (modified where possible to conform)	PERCENTAGE	ACREAGE
Shrubland		
California Sagebrush	20.34%	2990.74
Ceanothus Chaparral	3.23%	474.96
Chamise	1.03%	150.85
Coast Prickly Pear Succulent Scrub	0.05%	7.49
Lower Montane Mixed Chaparral	26.51%	3897.82
Riparian Mixed Shrub	0.15%	21.83
Scrub Oak	0.09%	12.85
Sumac Shrub	15.28%	2245.67
Total	*66.68%*	*9802.20*
Hardwood Forest/Woodland		
Black Walnut	0.15%	22.74
Coast Live Oak	8.81%	1295.76
Coastal Mixed Hardwood	0.73%	107.51
Non-Native/Ornamental Hardwood	0.31%	45.96
Riparian Mixed Hardwoods	1.36%	200.30
Valley Oak	0.33%	47.79
Total	*11.70%*	*1720.06*
Conifer Forest/Woodland		
Bigcone Douglas-Fir	0.17%	25.15
Non-Native/Ornamental Conifer/Hardwood Mixture	0.15%	22.11
Total	*0.32%*	*47.27*
Grassland		
Non-Native/Ornamental Grass	0.05%	7.99
Annual Grasses and Forbs	13.76%	2022.98
Total	*13.81%*	*2030.97*
Other		
Nurseries	0.00%	0.33
Pastures and Crop Agriculture	0.02%	2.55
Urban	4.37%	641.83
Urban - related Bare Soil	2.97%	437.03
Barren/Rock	0.13%	19.16
Total	*7.49%*	*1100.90*

Figure 1 Dozer lines along Oat Mountain Ridge with non-precise rare plant polygons

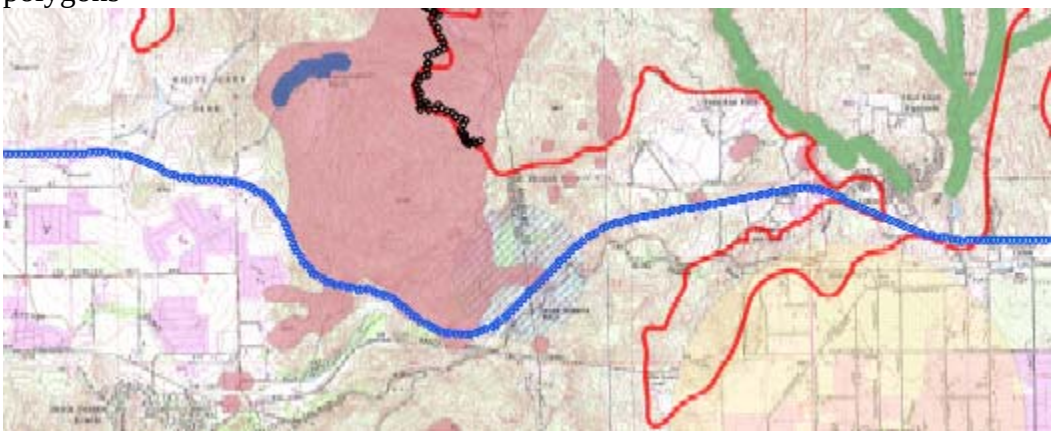


Dozer lines are in Black

Figure 2 Dozer lines along Rocky Peak, behind the Hummingbird Ranch development with non-precise rare plant polygons

Dozer lines are in Black

Figure 3 Fire suppression repair line that aligns with Highway 118 with non-precise rare plant polygons



Dozer lines are in Blue

DRAFT TECHNICAL SPECIALIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

Resource: Marine Resources/Fisheries

Fire Name: SESNON FIRE CA-LAC-08231953 November 2008

Author Name: Christian McKibbin, Fisheries Biologist
Department of Fish and Game
3795 East Telegraph Road
Fillmore, CA 93015
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I. Resource Condition Assessment

A. Resource Setting

The 14,703 acre Sesnon Fire burned portions of Federal, State, City and private lands in October of 2008. Headwater portions of the Los Angeles River and smaller Calleguas Creek burned. This report focuses on marine and fishery resources affected by the fire. The fire directly affected no fish habitat, and the area has no potential habitat for native or non-native fish species, as there is very little water in the burned area. However, potential sedimentation issues may arise for downstream habitat and communities after precipitation events. Downstream movement of sediment may ultimately affect lagoon and coastal areas associated with the two watersheds. The State Emergency Assessment Team (SEAT) was tasked with identifying potential values at risk including people, homes, businesses, infrastructure, and natural resources.

Areas evaluated were in the Santa Susana Mountains in Ventura and Los Angeles Counties. Surveyed areas were within burned portions of Devil Canyon, Browns Canyon, Limekiln Canyon and Aliso Canyon, which are tributaries to the Los Angeles River. Las Llajas Canyon and Chivo Canyon were inspected and are tributary to Arroyo Simi, which is tributary to Calleguas Creek, ultimately feeding Mugu Lagoon on the coast, South of Oxnard.

B. Survey Methods

Primary tributaries within the burn were surveyed for potential risk to fishery and marine resources. Initial reviews of natural resources potentially impacted were made using the California Natural Diversity Database (CNDDB). Fire severity, watershed, vegetation type and burned area reflectance maps provided by Cal Fire were also helpful in evaluating potentially affected resources. Several sites in each of the canyons associated with these primary tributaries were selected for on-site inspections. Access was gained using either county or fire roads which connect the lower and upper portions of the canyons. Sites along dry creek beds allowed for close observations, and ridge roads allowed for greater views of watersheds and burn areas. While making field

observations, notes and digital photographs were taken and catalogued, and GPS way points were recorded.

C. Resource Condition after Fire

An increase in erosion is expected after a fire. Since protective vegetation has burned, rain from post-burn storms falls directly on exposed soils, carrying away loose sediments. Dead vegetation may also increase erosion potential due to plants loosing root systems causing soil instability. Cattle grazing practices may be leading to an increase in down slope movement of material as well. Cattle trails expose loose materials to the erosive forces of wind and water, further increasing erosive potential.

Soils in the Santa Susana mountain range have great erosion potential, where naturally highly erosive materials are prevalent. These highly erosive materials are common within this mountain range and each affected watershed (see soils section).

D. Species at Risk

Species at risk include fish and invertebrate species found in watersheds and lagoons in Southern California that could potentially be affected by post fire conditions.

II. Findings of the On-The-Ground Survey (Observations)

E. Identify Values at Risk (Post Fire)

Fire severity maps as well as field observations noted some portions of the burn were more affected than others. Areas of high burn severity were observed in Limekiln, Devil and Browns canyons, while moderate and low severity burns were observed in the western areas of Las Llajas and Chivo canyons. Erosion in these canyons can be expected, and erosion forces will be greater in areas with high burn severity. An increase in deposition in low land areas is expected from increased erosion. Sediment from the upper portions of the Los Angeles River and Calleguas Creek watersheds will wash down and may cause problems for down stream habitat and communities. Water quality in downstream portions of the watershed, as well as coastal areas, may be negatively affected by increased runoff and sediment. Sediment may chemically alter habitat and environments in lower portions of the Los Angeles River and Calleguas Creek. Ash will increase pH levels and dissolved oxygen will decrease in aquatic systems. Sediments may collect in the bays of these two watersheds: the Los Angeles River at Seal Beach Harbor, and Calleguas Creek at Mugu Lagoon. Increased sediment accumulation in these bays will fill in and alter existing bay formations and depth.

Habitat loss was observed throughout the Sesnon burn zone. A large majority of riparian areas burned, where fire used these corridors to spread up or down canyons. While there are not quantities of water to provide for fish populations, aquatic stage amphibians and aquatic invertebrates exist where above ground water is available. Riparian areas are also important for birds and provide larger mammals with drinking water. Reduction of

riparian cover will lead to increases in solar radiation, raising water temperatures and potentially reducing available water to wildlife.

III. Recommendations

The remaining unburned areas in or around the Sesnon fire should be protected and preserved specifically for wildlife habitat. Existing riparian habitat will be critical to animals. This remaining habitat is also important for rehabilitation of the burn zone as it will be a plant source allowing for recolonization of native plants.

Burned areas should be monitored until significant regrowth has occurred. Severely burned areas should be protected from recreation use. Cattle grazing and recreational activities such as hiking and mountain biking will increase erosion. Due to the extremely erosive nature of existing soils, even small amounts of human use can be very harmful given the post burn fragility of the area. Foot activity should be limited to protect and increase the likelihood and speed of plant colonization.

Management should focus on upstream rehabilitation to minimize down stream movement of sediments. Native plants can be placed in burned riparian areas to help reestablish critical wildlife habitat. Planting native vegetation will also help in creating soil stability, eventually reducing erosion potential and rehabilitating hillsides. Post-fire surveys as well as long-term assessments should be considered to insure rehabilitation efforts are effective and native plant and animal communities return successfully. Similar surveys and long term monitoring should occur in lower portions of the watershed and estuaries to help mitigate disturbance created by increased sediment and pollutants.

IV. References

BIOS, Biological Information Observation System, California Department of Fish and Game, Sacramento California

California Natural Diversity Database, California Department of Fish and Game, Sacramento, California

Fire Burn Intensity Classification, United States Department of Agriculture
www.co.nrcs.usda.gov/technical/eng/BURNINTENSITYfactsheet.pdf

VI. Contacts

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DRAFT TECHNICAL SPECIALTIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

Resource: Cultural Resources

Fire Name: SESNON FIRE: CA-LAC-08231953 November 2008

Author Name: Steph Velasquez, Associate State Archaeologist
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I. Resource Condition Assessment

A. Resource Setting

The Sesnon Fire burned approximately 14,703 acres in the Santa Susana Mountains, just north of Highway 118 and the Topanga Canyon Boulevard intersection in Simi Valley (Figure 12). The region's fire history indicates the Sesnon fire's western half burned in the 2003 Simi Fire, while the eastern portion last burned in the 1980s (Figure 12). The fire impacted lands managed by the Mountains Recreation and Conservancy Authority, Santa Susana Pass State Historic Park, Los Angeles County and City and Ventura County. Of the total burned acreage, 1.56% burned with high intensity, 34.84% with moderate intensity, 34.40% with low intensity and 15.26% qualifies as unburned; due to insufficient data, intensity for the remaining 13.94% is unassigned (Figure 5).

The Sesnon fire burned the Santa Susana Range's Oat Mountains in terrain dominated by steep (up to 60°), southwest to southeast trending slopes incised by Las Llajas canyon to the west, Devil and Brown's canyons through the middle and Limekiln and Aliso Canyons to the east. The area encompasses Rocky Peak, Stony Point and Mission Point, with elevations ranging from approximately 1,100 to 3,400 feet. Geologic formations comprising the burn area include Modelo, Chatsworth, Saugus and Towsley conglomerate sandstone containing shale, quartzite, porphyry and granitic inclusions (Yerkes and Campbell 2005). Soils are well drained, sandstone residuum sandy and clayey loams (Web Soil Survey) supporting chamise (*Adenostoma fasiculatum*), manzanita (*Arctostaphylos sp.),* sage (*Artemisia sp.)* and yucca (*Yucca sp*.), with oak (*Quercus agrifolia*), sumac (*Malosma laurina*), willow (*Salix sp.)* and sycamore (*Platanus racemosa*) occurring in sheltered canyon areas.

The Santa Susana Mountain region sustained a rich cultural history beginning approximately 8,000 years ago (Moratto 2004:79) when small, nomadic groups

entered the region (Moratto 2004:76). These nomadic practices transitioned through time to more sedentary lifestyles, and by the time of contact the hunting-and-gathering Ventureño Chumash and Gabrieliñó/Tongva inhabited the Santa Susana region (Heizer 1978). The Santa Susana Mountains not only attracted seasonal forays from coastal Chumash peoples, but also supported year round habitation for inland groups (Moratto 2004:118). Spanish expeditions entered the Santa Susana region in the mid-1500s, and full European contact ensued in the late 1700s; missions were well established by the 1800s. Historic use of the Santa Susanas includes stagecoach lines, rail lines and ranching (Mealey et al. 2005:3). In addition to these typical uses, the Sesnon burn area encompasses oil fields, locations associated with Hollywood filmmaking and a Cold War Era Nike anti-aircraft missile defense site.

Prehistoric site types common to the Sesnon fire area comprise habitation, rockshelter and encampment sites, lithic procurement and tool manufacture sites, milling locations, burials and rock art. Expected historic elements include ranching, drilling and habitation features. Rock art generally occurs in rockshelters and caves (Moratto 2004:119) located away from permanent settlements (Heizer 1978:519); the inland region's rock art is localized to the Simi Hills, Santa Monica Mountains, Sespe and Piru Creeks (Heizer 1978:519). Cultural materials indicative of this region include "doughnut" rocks, olivella beads, basketry (Heizer 1978), steatite bowls (Kroeber 1976:563), and clam shell disks utilized for monetary exchange (1976:564). Anticipated lithic materials include chert, quartzite, quartz and chalcedony.

B. Methods

A "Do-It Yourself" archaeological records search conducted at the South Central Coast Information Center, California State University – Fullerton identified 49 sites within the Sesnon fire perimeter. The search was conducted for portions of Townships 2 and 3 North, Ranges 16 and 17 West on the Oat Mountain and Simi Valley East USGS Topographic Quadrangles.

Between October 31 and November 7, 2008, the Sesnon SEAT archaeologist conducted field evaluations for all known sites within the fire perimeter. Damage incurred during suppression efforts was evaluated during the incident. All site evaluation summaries will be submitted to the South Central Coast Information Center, California State University – Fullerton.

In addition to assessing known sites, the archaeologist conducted reconnaissance surveys at locations identified by team members as assets at risk and areas of potentially high cultural sensitivity. Surveyed areas include the Sulphur Springs Guzzler, Brown's Canyon Timber Bridge, Brown's Canyon Concrete Bridge and Debris Flow, the Brown's Canyon Sediment Disposal Site and portions of Bee Canyon. Three sites, the Brown's Canyon Timber Bridge and two historic occupation sites, were documented during these surveys.

C. Communications

Contact was made with the Native American Heritage Commission and the following groups on November 4th, 2008: Chairperson Linda Candelaria of the Gabrielino/ Tongva Council; Chairperson Henry Duro of the San Manuel Band of Mission Indians; Environmental Coordinator Ann Brierty of the San Manuel Band of Mission Indians; Randy Guzman-Folkes; Beverly Salazar Folkes; Director Ron Andrade of the L.A. City/County Native American Indian Community; the Santa Ynez Band of Mission Indians and the Santa Ynez Tribal Elders Council; the Owl Clan; Chairperson Rudy Ortega of the Fernandeno/Tataviam Tribe/San Fernando Mission Indians; Chief Mark Vigil of the San Luis Obispo County Chumash; Julie Tumamait.

A field visit with the Santa Susana Pass State Historic Park Archaeologist Barbara Tejada occurred on November 3rd. Tejada indicated she made post-fire visits to sites located within the Park's burned regions, that the area of highest cultural sensitivity did not burn and that no further Park investigation was likely required.

II. Findings of the On-the-Ground Survey (Observations)

A. Identify Values at Risk (Post-Fire)

Fire causes myriad adverse affects on cultural resources common to the Sesnon burn area. Fire's affect on cultural resources is influenced by its intensity (how hot it burns) and duration (how long it burns). Factors affecting these elements include fuel type, fuel load and arrangement, fuel condition, topography and weather (Wiltz n.d.). In any fire, organic materials like textiles and wooden structural elements are susceptible to combustion. High temperatures (intensity) or long exposure time (duration) can also alter artifacts. Lithic materials discolor, craze and fracture (DeBano et al. 1998:271) when temperatures are high enough or exposure is long enough; temperatures reaching ~350°c to 500°c affect cryptocrystalline silicates (Buenger 2003), and sandstone surfaces can discolor, spall and become more friable when temperatures reach 300°c (Winthrop 2005). Bone and shell degrade at temperatures near 700°c (Buenger 2003), and historic ceramics, glass and metals can melt and craze at these higher temperatures (Winthrop 2005). Furthermore, temperatures of ~675° alter archeomagnetic dates on lithic materials, and carbon-14 dating methods are impacted by the introduction of charcoal (DeBano et al. 1998:274). Smoke obliteration, chemical exposure, spall and exfoliation also damage sandstone shelters and rock art surfaces. Indirect fire affects on cultural resources include erosion, soil deflation resulting from root combustion that can destroy subsurface integrity, burned out trees that can fall onto site elements and heightened visitor impacts due to increased visibility.

Conditions on the Sesnon fire generated a primarily low to moderate intensity, short duration fire. Therefore, primary risks to cultural resources include damage to rockshelters, rock art features, alteration of midden soil, consumption of organic historic features, erosion threats and increased site visibility. Furthermore, treatments

identified by SEAT members introduce additional potential to impact cultural resources.

a. Specific Observations

Sites visited during reconnaissance appeared in good condition and not adversely affected by fire. Assessments include evaluation of burn severity, percentage of site surface burned, impact to cultural materials, erosion potential and need for preservation treatment.

High burn severity assigned to sites exhibiting complete vegetation consumption, root holes and white ashy soot pockets.

Sites identified as moderate burn intensity are those with duff consumption, burned ladder fuels and isolated crown consumption.

Sites evaluated with low burn intensity show partial duff consumption, little to no ladder fuel consumption, crown scorching and some canopy consumption.

Table 1. Assessments for Sites Located within the Sesnon Fire Perimeter.

Site Number	Site Type	Date Assessed	Burn Severity	Impacts / Comments
CA-LAN-89	Prehistoric Habitation / Rockshelters	11/1/08	Low	High visitor use; artifacts fairly well picked over; blackened surfaces, but shelters untouched
CA-LAN-93	Prehistoric Habitation / Rockshelters	11/6/08	Unburned	Features not relocated at identified position; however, area was not impacted by fire
CA-LAN-209	Prehistoric Habitation / Rockshelters	11/1/08	Moderate	~80% surface area burned; area affected by visitor usage; sandstone blackened in areas, but no spalling; shelters unaffected. Primary concern is increased visibility.
CA-LAN-301	Burial Site	11/2/08	Low-Moderate	~40% surface area burned; South Coast contracting stem found on site; burial likely removed – no evidence remains.
CA-LAN-337	Prehistoric Encampment	11/7/08	Low-Moderate	100% site surface burned; blackened stone artifacts – no crazing or fracture; sandstone unaffected by fire; increased visibility.
CA-LAN-338	Prehistoric Lithic Scatter	11/7/08	Low-Moderate	100% site surface burned; blackened stone artifacts – no crazing or breaking; some sheet wash occurring on site; increased visibility.
CA-LAN-357	Burial	11/1/08	Unknown	Site is located under private horse ranch and was not evaluated
CA-LAN-473	Prehistoric Lithic Scatter	11/2/08	Low – Severe	~90% surface area burned; blackened artifacts – no crazing or fracture

Site Number	Site Type	Date Assessed	Burn Severity	Impacts / Comments
CA-LAN-474	Prehistoric Habitation with Cemeteries	11/7/08	N/A	Site essentially removed through development of Sesnon Boulevard and surrounding community
CA-LAN-761	Prehistoric Milling and Lithic Locus	11/7/08	Unburned	N/A
CA-LAN-649	Prehistoric Habitation	11/6/08	Moderate – Severe	80% site surface burned; site heavily impacted by visitor use; shelter un-impacted by fire; gullying occurring on site
CA-LAN-665	Prehistoric Quarry	11/2/08	Moderate	100% site surface burned; blackened lithics – no fracture or crazing
CA-LAN-713	Prehistoric Encampment	11/1/08	Moderate	Site likely no longer intact – 1981 recording could not relocate. Current assessment made for site's known location
CA-LAN-762	Prehistoric Lithic Scatter	10/31/08	Unburned	N/A
CA-LAN-781	Prehistoric Lithic Scatter	10/31/08	Unburned	N/A
CA-LAN-782	Prehistoric Habitation / Rockshelter	10/31/08	Unburned	N/A
CA-LAN-809	Prehistoric Lithic Scatter	11/2/08	Unknown	Access issues
CA-LAN-810	Prehistoric Lithic Scatter	11/2/08	Unknown	Access issues
CA-LAN-814	Prehistoric Lithic Scatter	10/31/08	Unburned	N/A

Site Number	Site Type	Date Assessed	Burn Severity	Impacts / Comments
CA-LAN-815	Prehistoric Lithic Scatter	10/31/08	Unburned	N/A
CA-LAN-870	Prehistoric Lithic Scatter	10/31/08	Unburned	N/A
CA-LAN-879	Prehistoric Habitation / Rockshelters	10/31/08	Unburned	N/A
CA-LAN-880	Prehistoric Lithic Scatter	11/2/08	Unburned	N/A
CA-LAN-881	Prehistoric Lithic Scatter	10/31/08	Unburned	N/A
CA-LAN-882	Prehistoric Quarry	11/2/08	Low – Moderate	Blackened lithic materials – no crazing or fracture
CA-LAN-901	Sandstone Feature	11/6/08	Moderate	Blackened lithic materials; sandstone blackened and spalled; BRMs sooted but not impacted – possible new prehistoric features identified in sandstone formation west of known features
CA-LAN-963	Prehistoric Lithic Scatter	11/3/08	Unburned	N/A
CA-LAN-995	Prehistoric Habitation / Rockshelters	11/6/08	Low	Site damaged by recreational use, no fire impact
CA-LAN-996	Prehistoric Habitation / Rockshelters	11/6/08	Low – Moderate	50% site surface burned; portion of shelter ceiling blackened and spalled; lithic materials blackened – not crazed or fractured
CA-LAN-997	Prehistoric Habitation / Rockshelters	11/6/08	Low	Only impacts to site from recreational use

Site Number	Site Type	Date Assessed	Burn Severity	Impacts / Comments
CA-LAN-998	Prehistoric Lithic Scatter	11/6/08	Low – Moderate	50% site surface burned; sandstone surfaces blackened with some spalling; lithic materials blackened, not crazed or fractured; new rockshelter features identified
CA-LAN-1043	Burial	11/1/08	Moderate	100% surface burned; burial removed – no remnants
CA-LAN-1049	Prehistoric Lithic Scatter	11/7/08	Unburned	N/A
CA-LAN-1050	Prehistoric Lithic Scatter	11/7/08	Unburned	N/A
CA-LAN-1097	Prehistoric Habitation / Rockshelter	11/3/08	Low	~60% site surface burned; shelter unaffected; lithic materials blackened and broken. Recommend additional site evaluation due to improved surface visibility.
CA-LAN-1113	Prehistoric Lithic Scatter	11/7/08	Low – Moderate	~40% site surface affected; spalling on sandstone formation on site; blackened lithic material
CA-LAN-1740	Historic Bridge	11/1/08	Unburned	N/A
CA-LAN-1741	Historic Structure	11/6/08	Low	Unaffected
CA-LAN-1742	Historic Features	11/6/08	Moderate	~60% surface area burned;
CA-LAN-1743	Prehistoric Lithic Scatter	11/1/08	N/A	Site removed by road cut
CA-LAN-1744	Prehistoric Lithic Scatter	11/6/08	Moderate	100% site surface burned; lithic materials blackened

Site Number	Site Type	Date Assessed	Burn Severity	Impacts / Comments
CA-LAN-1745	Prehistoric Lithic Scatter	11/6/08	Moderate	100% surface burned; lithic materials blackened
CA-LAN-2460	Prehistoric Lithic Scatter	11/7/08	Unknown	Site obliterated by dozer scrape not associated with fire suppression activity
CA-LAN-2826	Prehistoric Quarry	11/6/08	Low	Unaffected
CA-LAN-2827	Prehistoric Quarry	11/6/08	Low	Unaffected
CA-LAN-3498	Historic Fenceline	11/3/08	Unknown	Site previously destroyed by fire
CA-LAN-3499	Historic Features	11/3/08	Unknown	Site identified as no-concern by Santa Susana Archaeologist
CA-LAN-3502	Spahn Ranch	10/18/08	Low	Site previously burned and graded
CA-LAN-3793	Historic Structural Remnant	11/6/08	Low	Unaffected
Brown's Canyon Timber Bridge	Historic Bridge	11/5/08	Severe	Bridge's wooden elements destroyed by fire. Bridge closed as public safety precaution and will be replaced; recommend HABS/HAER documentation prior to removal.
Sesnon Site 1	Historic Occupation	11/1/08	Moderate – Severe	Site previously destroyed; wooden elements on site consumed; root holes
Sesnon Site 2	Historic Structure	11/6/08	Moderate	Stone and brick foundation stained; visibility

III. Emergency Determination

Identified values at risk include potential damage to cultural resources from exfoliation of sandstone surfaces, site erosion from increased surface water runoff, increased visitor impacts due to heightened visibility and fire-consumed historic elements. Post-fire impact evaluations revealed the Sesnon fire generally did not reach conditions causing adverse affects to sandstone formations, that potential for erosion loss is no greater than before the fire, and that most sites are in areas already impacted by visitors. One historic resource (Site "Brown's Canyon Timber Bridge") was destroyed in the fire and will be removed.

IV. Recommendations

Discussion/Summary/Recommendations

1. The Brown's Canyon Timber Bridge should have full scale HABS/HAER documentation prior to replacement;

2. Full site documentation should be completed on the Nike Site;

3. Archaeological review shall occur prior to any additional rehabilitation or new construction efforts affiliated with recommended mitigation measures;

4. Native American consultation will be initiated prior to implementation of recommended mitigation measures, and if deemed necessary a Native American monitor will be present during undertaking;

5. No cultural concerns were identified in association with the Sulphur Springs Guzzler improvement, the Brown's Canyon Concrete Bridge and Debris Flow or the Brown's Canyon Sediment Disposal Site.

VI. References

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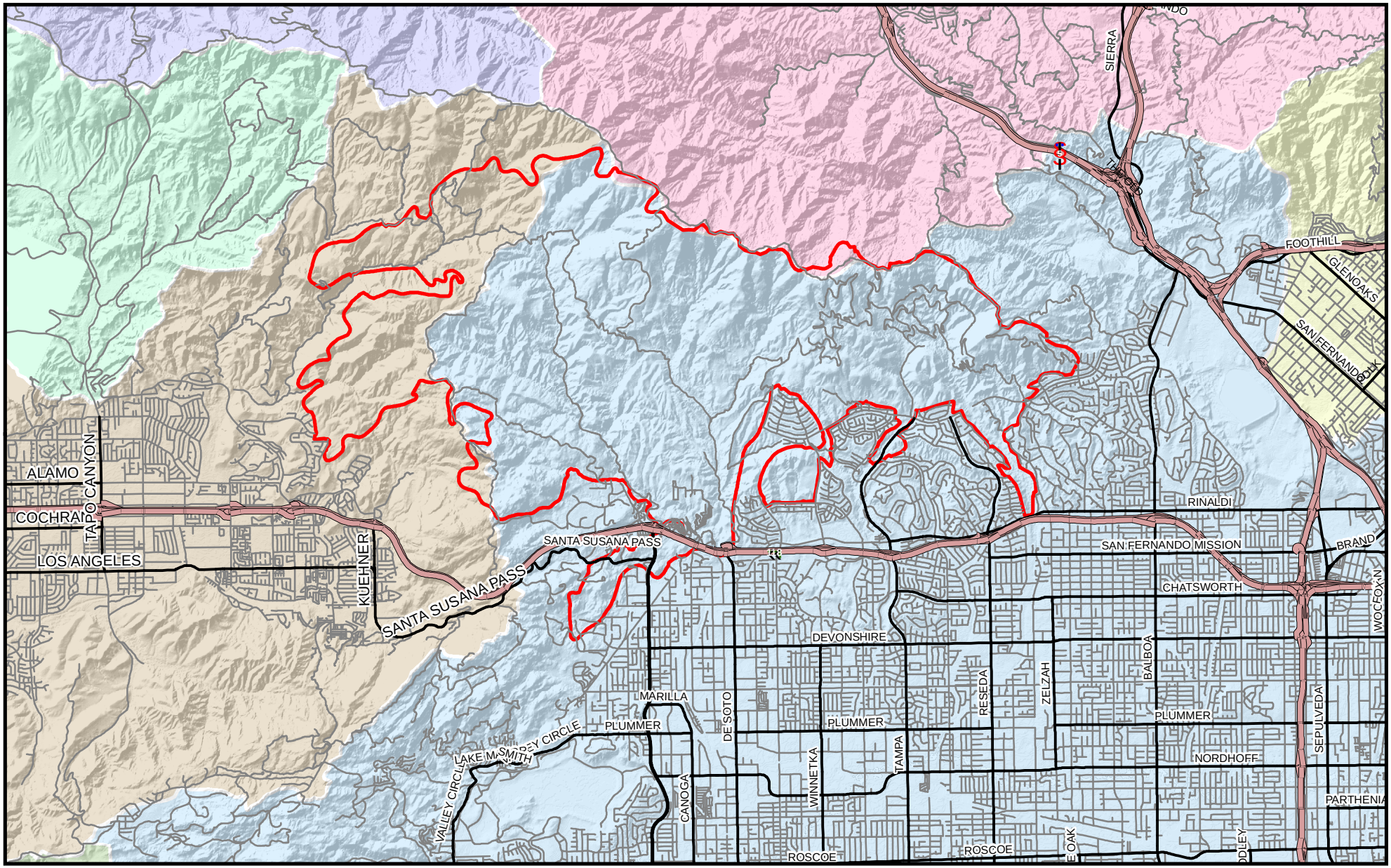


Sesnon Area Watershed Overview

Freeway
Highway
Primary Street
Secondary & Minor Street
Sesnon Fire Perimeter

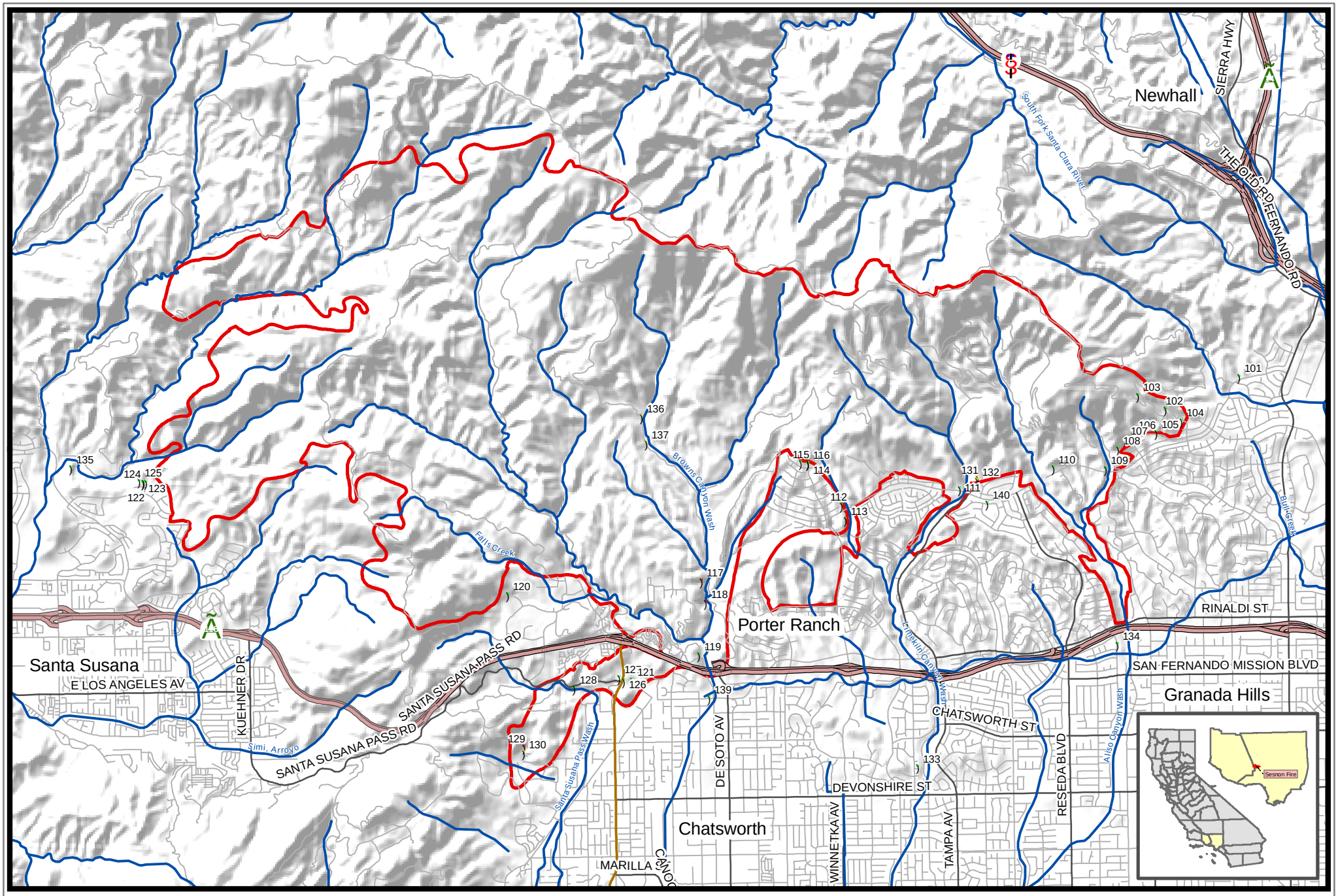
WATERSHED

Bull Canyon
Eastern
Gillibrand
Santa Felicia
Simi Valley
Sylmar

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 10, 2008

0 0.5 1 2
Miles

FIGURE 1



Sesnon Area Risk-to-Property Overview

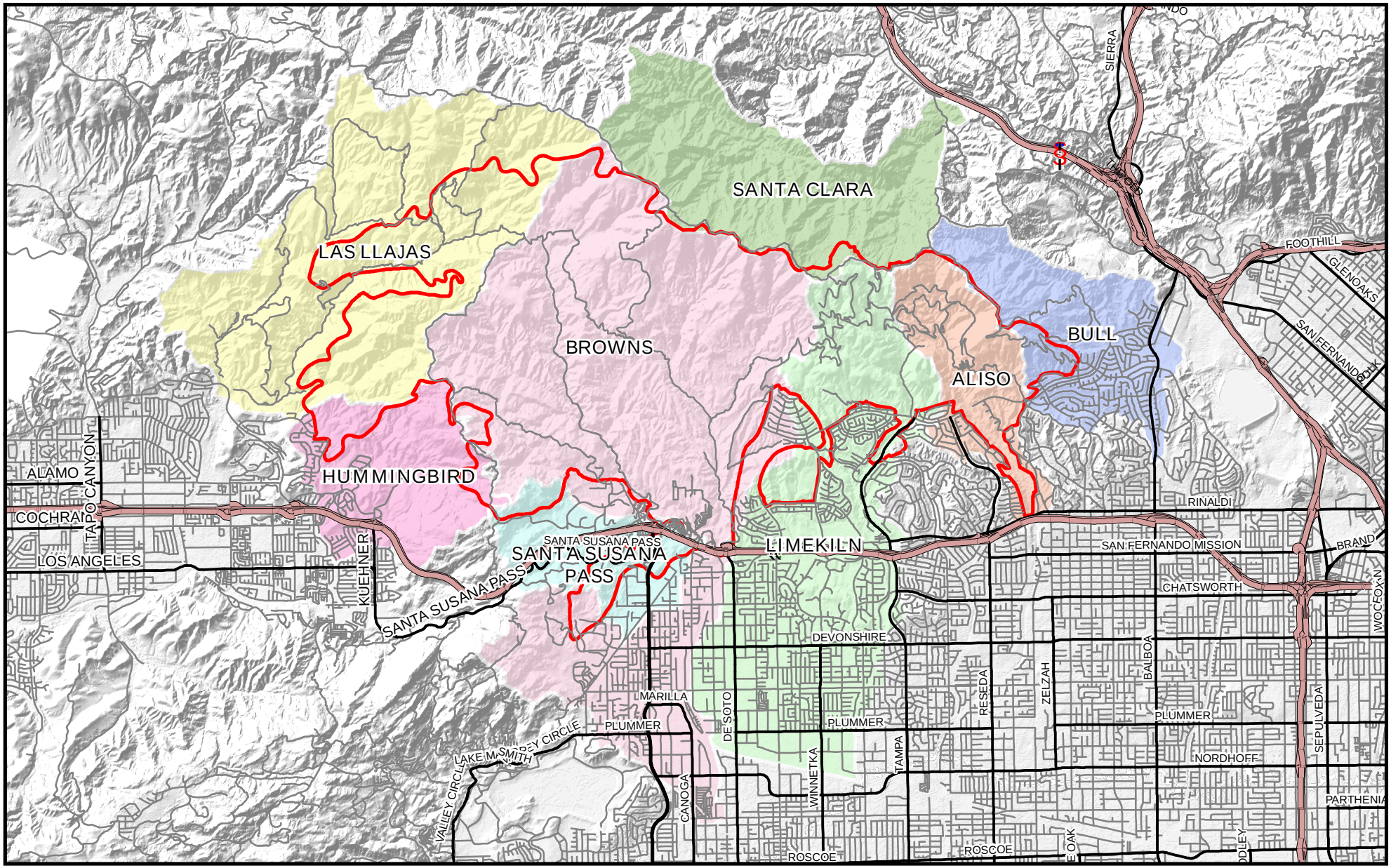
RiskToProp

- High
- Mod
- Low
- Hydrology
- Freeway
- Highway
- Primary Street
- Secondary Street
- Sesnon Fire Perimeter

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 10, 2008

0 0.5 1 2
Miles

FIGURE 2



Sesnon Area Subwatershed Overview

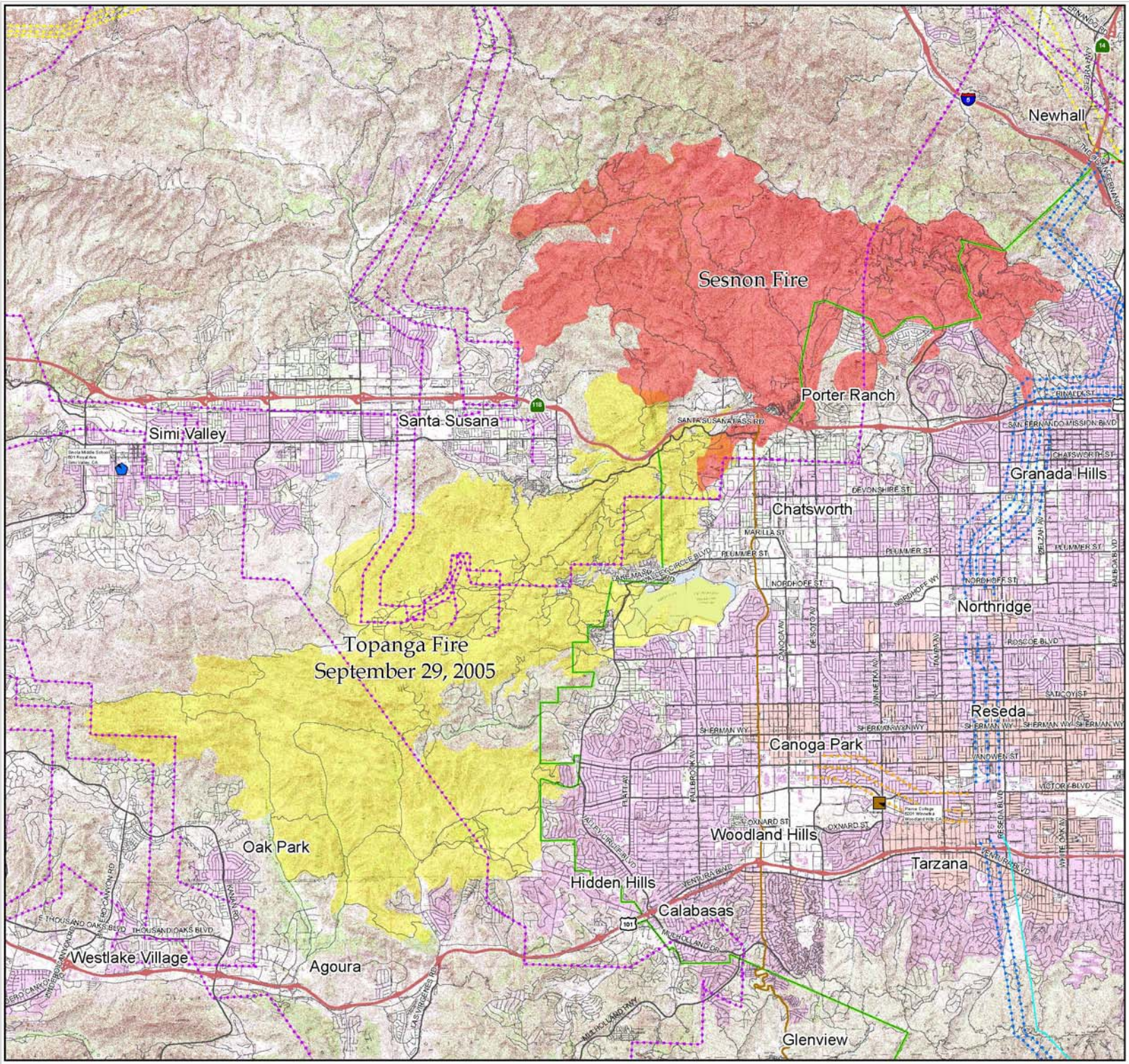
Freeway
Highway
Primary Street
Secondary & Minor Street
Sesnon Fire Perimeter

WATERSHED
ALISO
BROWNS
BULL
HUMMINGBIRD
LAS LLAJAS
LIMEKILN
SANTA CLARA
SANTA SUSANA PASS

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 8, 2008

0 0.5 1 2
Miles

FIGURE 3



Sesnon Fire Infrastructure

- Domestic Animal Shelter
- Evacuation Center

Transmission Line

- SCE - 66KV
- LA DWP - 115KV
- SCE - 220KV
- LADWP - 230KV
- LADWP - 230KV-UG
- LADWP - 500KV
- LADWP - 500KV-UG
- Freeway
- Highway
- Primary Street
- Secondary Street
- City of Los Angeles
- Sesnon Fire Perimeter
- Topanga Fire Perimeter

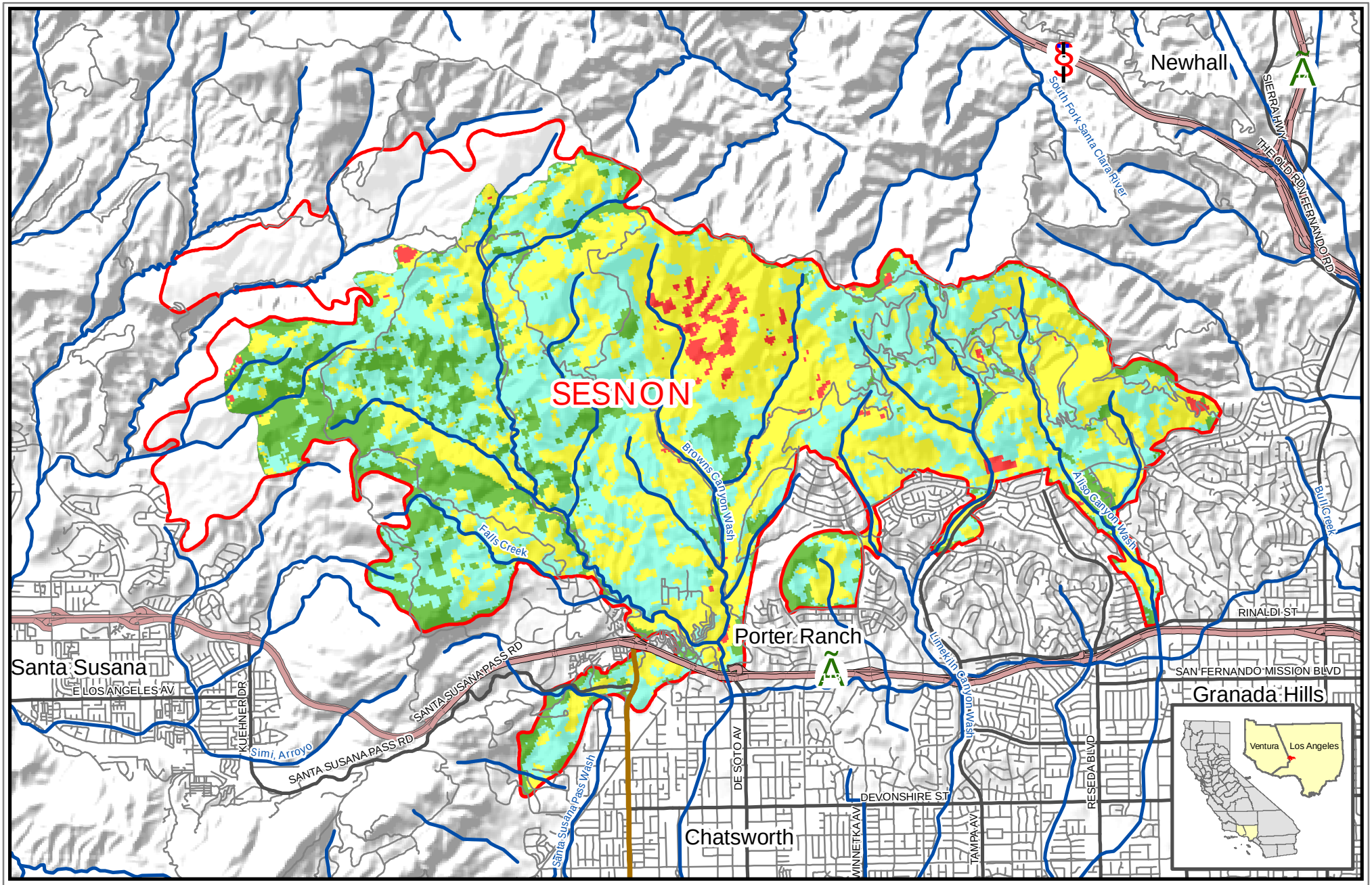
1 inch equals 2,750 feet

0 0.5 1 2

Miles

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 3, 2008

FIGURE 4



Sesnon Fire Severity

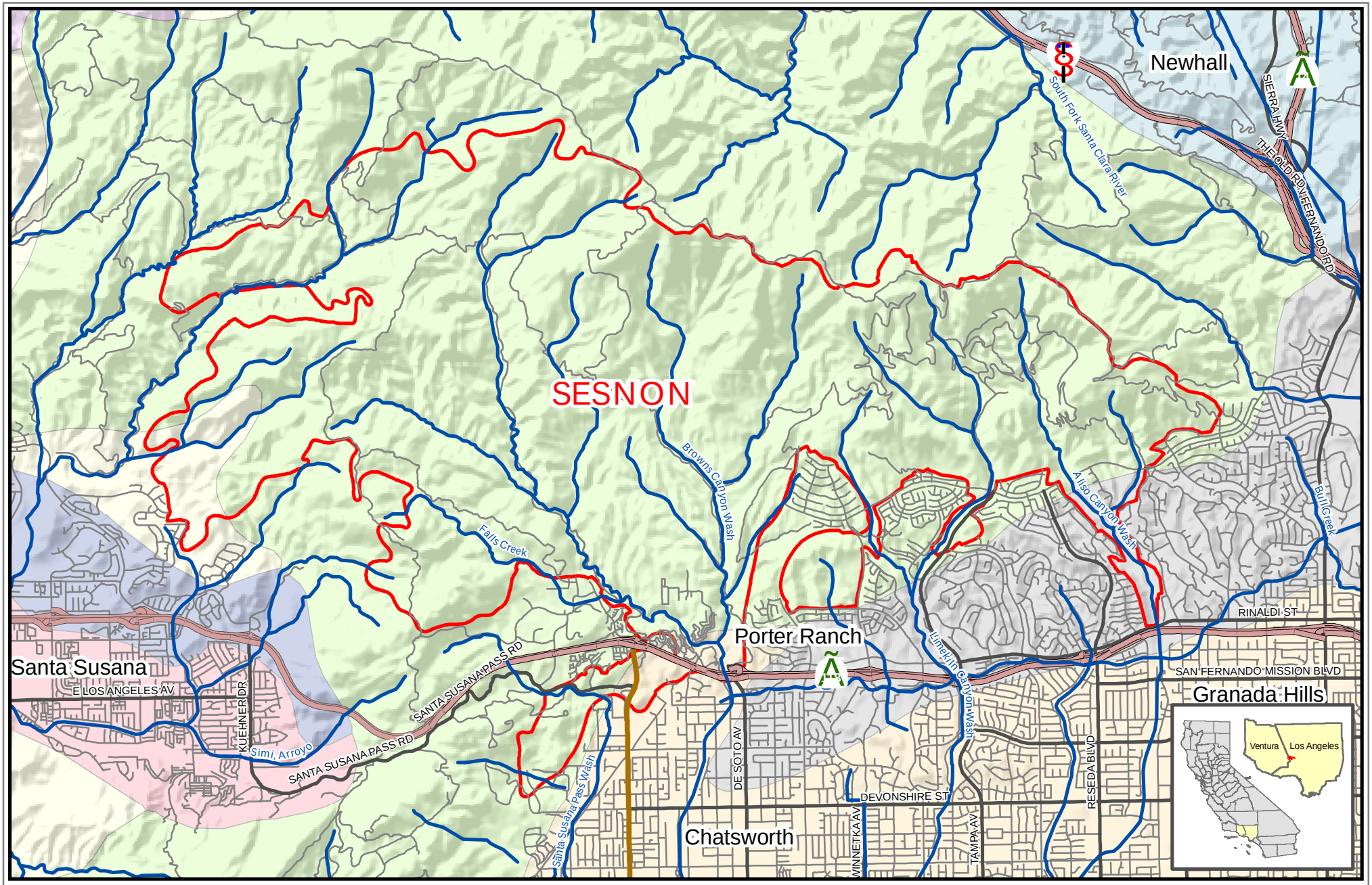
- Hydrology
- Freeway
- Highway
- Primary Street
- Secondary Street
- Sesnon Fire Perimeter

SEVERITY	
230 Acres - 1.56%	High
5,122 Acres - 34.84%	Moderate
5,062 Acres - 34.40%	Low
2,244 Acres - 15.26%	Unchanged/Very Low
2,045 Acres - 13.94%	Unknown

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 8, 2008

0 0.5 1
Miles

FIGURE 5



Sesnon Area Soils Overview

- Sesnon Fire Perimeter
- Hydrology
- Freeway
- Highway
- Primary Street
- Secondary Street

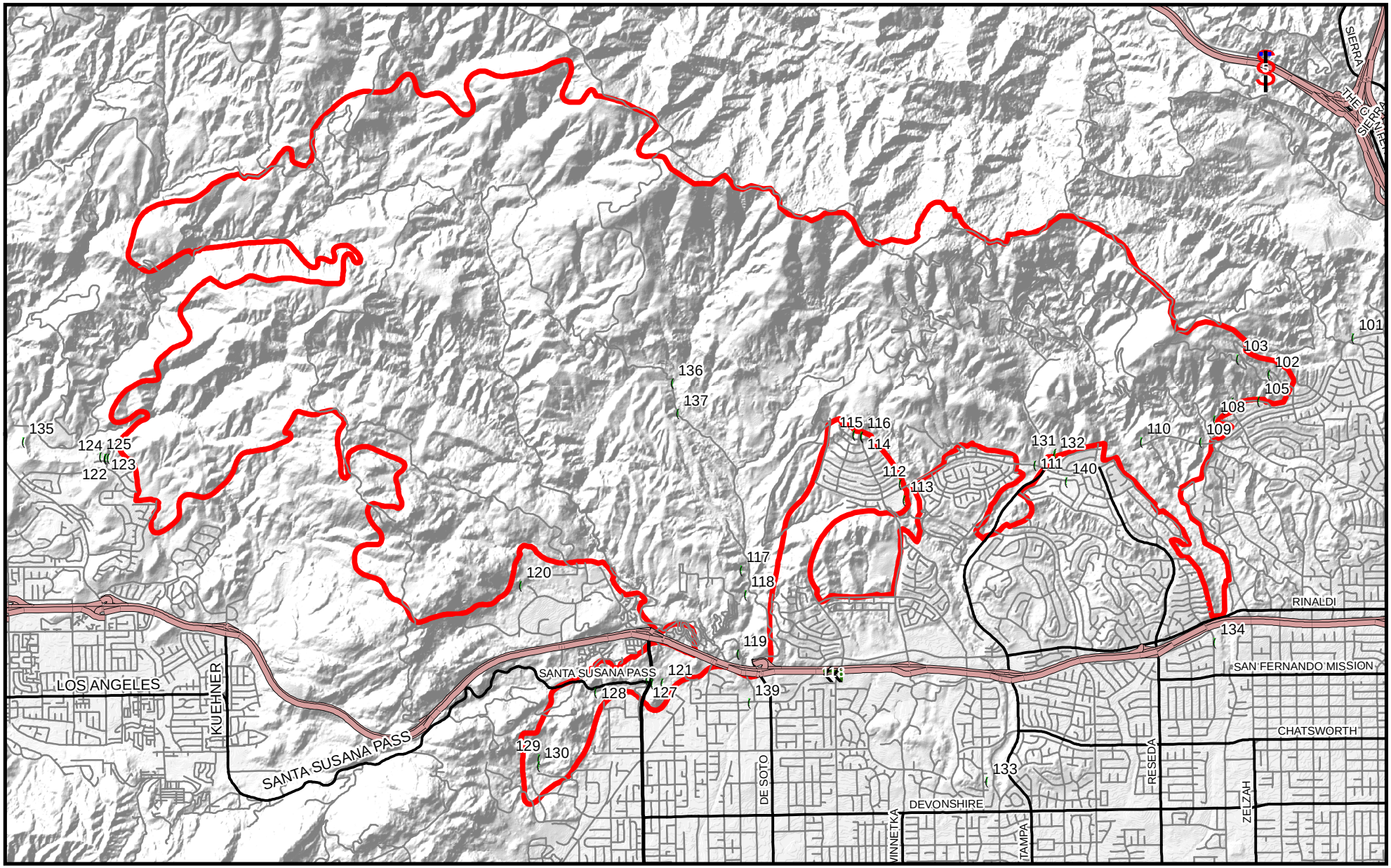
DESCR

- Rock outcrop-Lithic Xerorthents-Calleguas-Badland
- San Andreas-Arujo-Arnold
- San Benito-Castaic-Calleguas-Balcom-Badland
- Sobrante-Exchequer-Cieneba
- Soper-Chesterton
- Urban land-Sorrento-Hanford
- Water
- Xerofluvents-Salinas-Pico-Mocho-Metz-Anacapa
- Zamora-Urban land-Ramona

Projection: Teale Albers NAD 83
Created by: James Yano
Created on: November 8, 2008

0 0.5 1
Miles

FIGURE 6



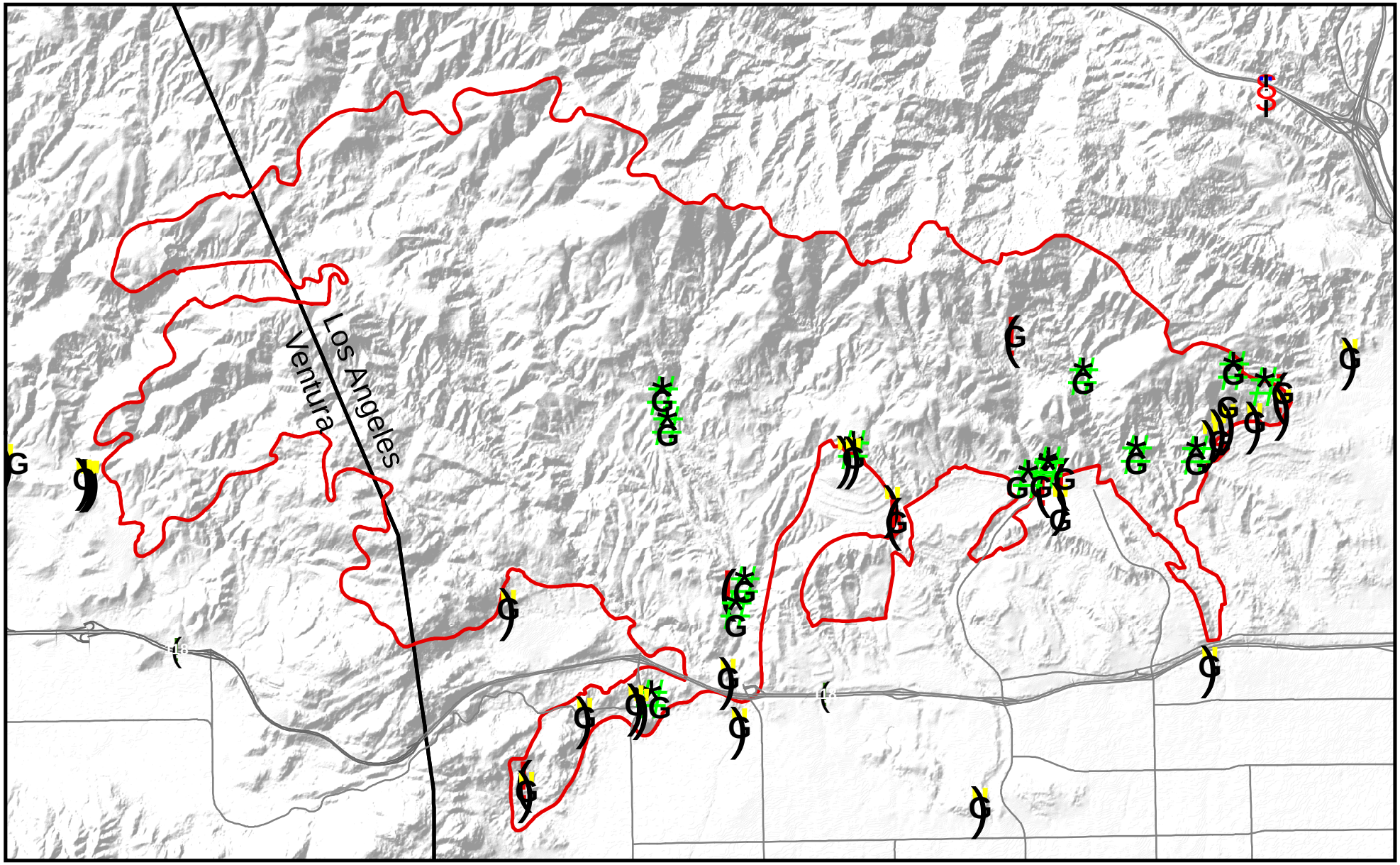
Waypoints Overview

Waypoints_20081107_Project
Freeway
Highway
Primary Street
Secondary & Minor Street
Sesnon Fire Perimeter

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 4, 2008

0 0.5 1 2
Miles

FIGURE 7



Sesnon Burn Site Evaluation

Level of Risk

Higher Moderate Lower

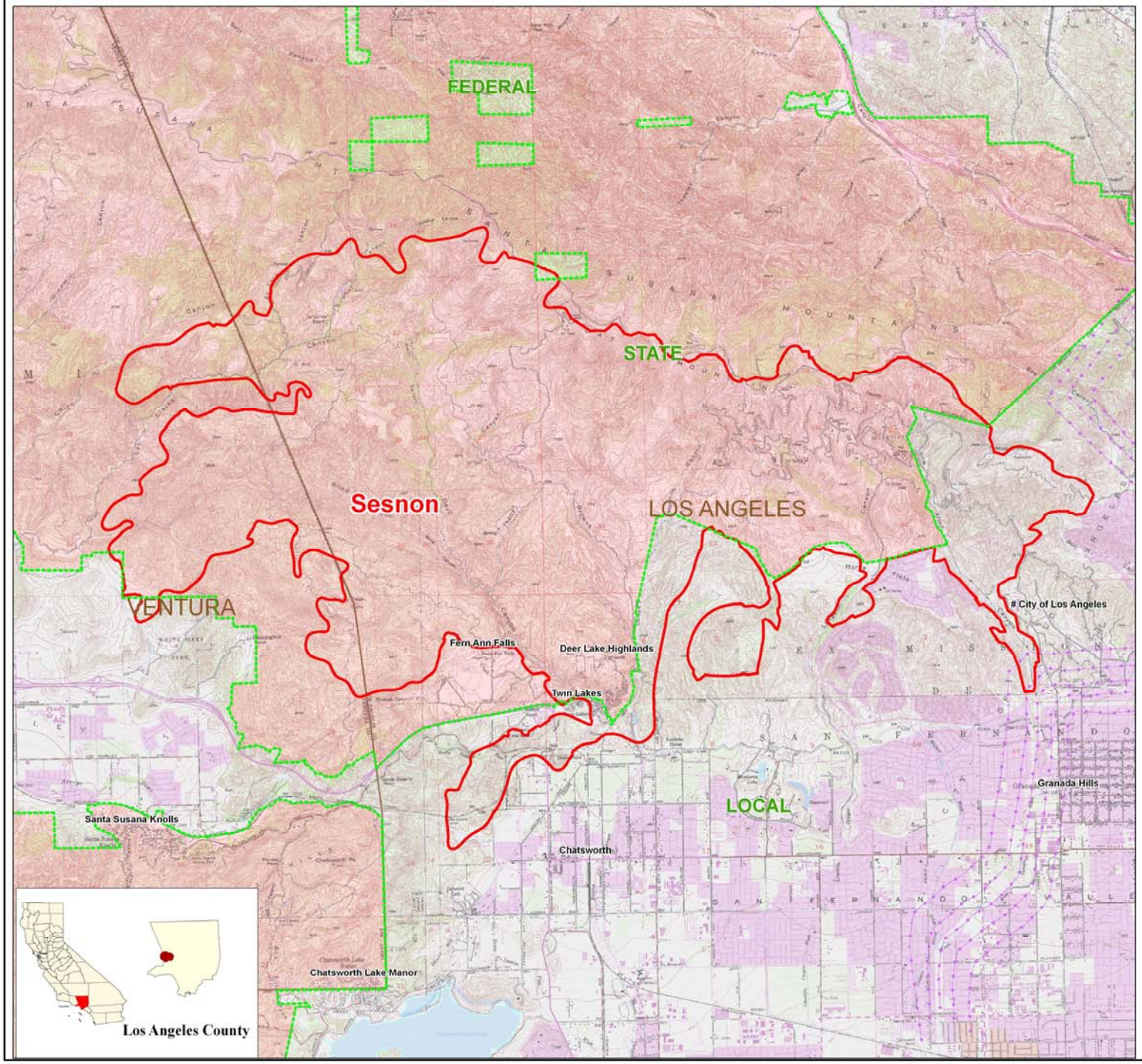
II

Projection: Teale Albers NAD 27
Created by: Richard Mendez, VCWPD
Created on: November 9, 2008

1 inch equals 5,500 feet

0 0.375 0.75 1.5 Miles

FIGURE 8



Sesnon Fire
Los Angeles County
Statewide Emergency Assessment Team (SEAT)

Direct Protection Overview Map

Direct Protection

DPA Group

- Federal
- State
- Local
- Fire Perimeter
- DPA Group Boundary

Transportation

- Freeways
- Highways
- Primary
- Secondary
- County Boundary
- River

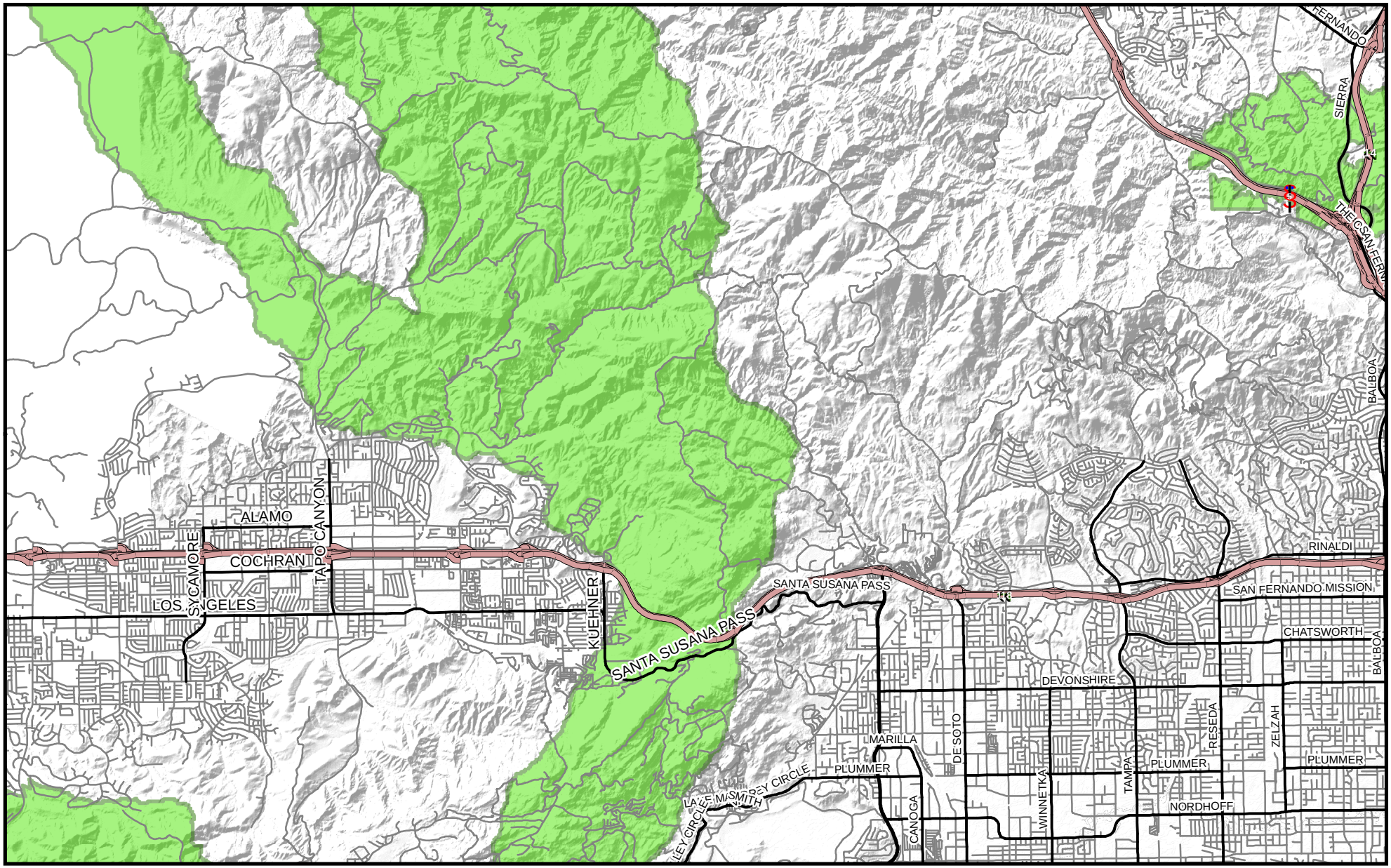
FIGURE 9

N W E S

0 0.25 0.5 1 1.5

Miles

Created by OES-GIS, M. Clay
October 23, 2008
Sources FAMWEB 209s
active_Incident Fires 2008
Sesnon_CA_LAC_8246455
Projects Sesnon_Government_Ownership_Map2_C_Size.mxd



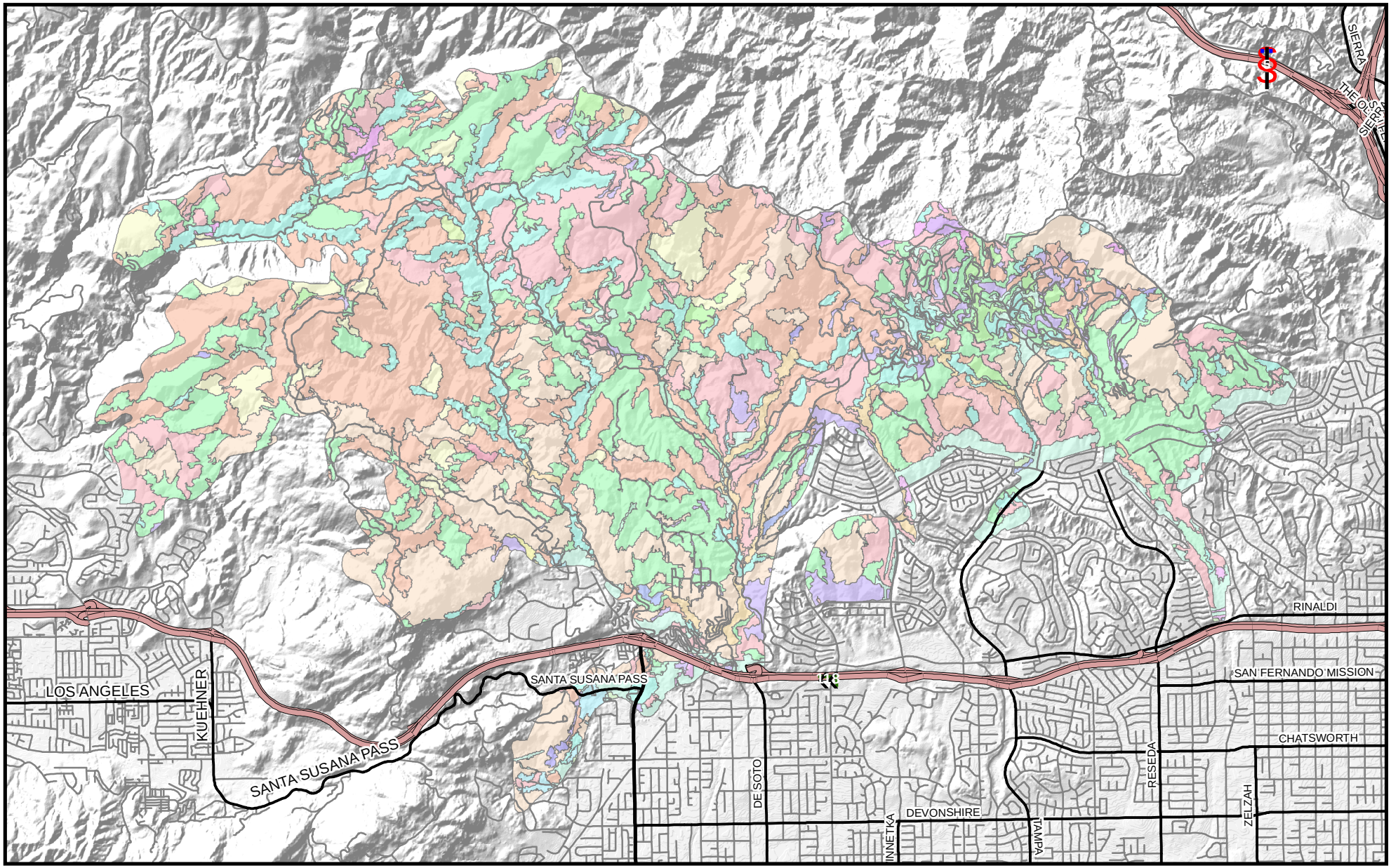
Sesnon Area Wildlife Corridor

- Freeway
- Highway
- Primary Street
- Secondary & Minor Street
- Sesnon Fire Perimeter
- Santa Monica - Sierra Madre Corridor

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 5, 2008

0 0.5 1 2
Miles

FIGURE 10



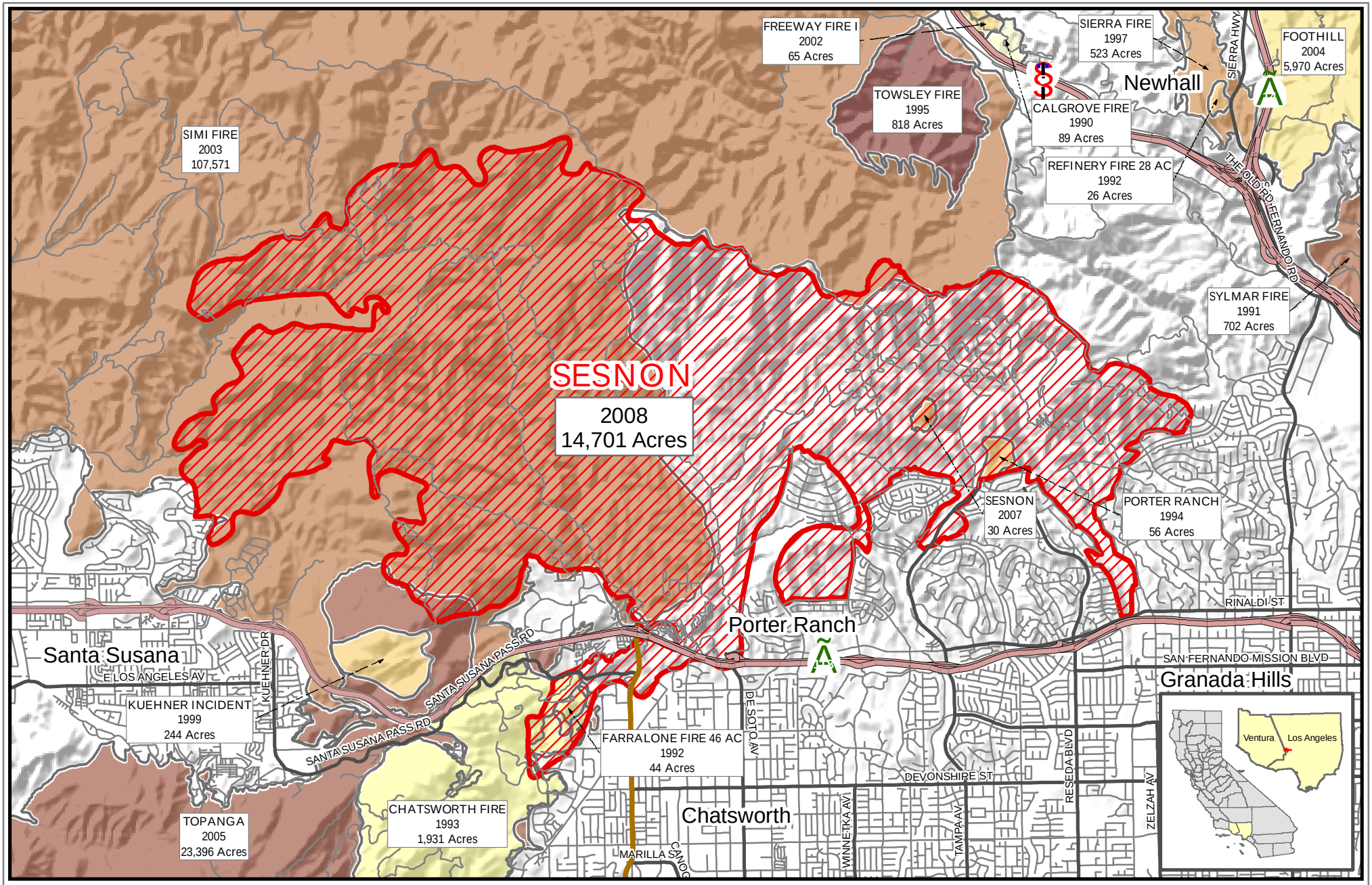
Vegetation Overview

- Sesnon Fire Perimeter
- Annual Grasses and Forbs
- Barren/Rock
- Bigcone Douglas-Fir
- Black Walnut
- California Sagebrush
- Ceanothus Chaparral
- Chamise
- Coast Live Oak
- Coastal Cactus
- Coastal Mixed Hardwood
- Lower Montane Mixed Chaparral
- Non-Native/Ornamental Conifer/Hardwood Mixture
- Non-Native/Ornamental Grass
- Non-Native/Ornamental Hardwood
- Nurseries
- Pastures and Crop Agriculture
- Riparian Mixed Hardwoods
- Riparian Mixed Shrub
- Scrub Oak
- Sumac Shrub
- Urban
- Urban - related Bare Soil
- Valley Oak

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 4, 2008

0 0.5 1 2
Miles

FIGURE 11



Fire History
1990 - Present

SESNON FIRE PERIMETER 2008

FIRE_NAME

- CALGROVE FIRE
- CHATSWORTH FIRE
- FARRALONE FIRE 46 AC
- FOOTHILL
- FREEWAY FIRE I
- KUEHNER INCIDENT
- PORTER RANCH
- REFINERY FIRE 28 AC
- SESNON
- SIERRA FIRE
- SIMI FIRE
- SYLMAR FIRE
- TOPANGA
- TOWSLEY FIRE

0 0.5 1 2
Miles

Projection: Teale Albers NAD 83
Created by: James Yano, City of Los Angeles PW BOE
Created on: November 4, 2008

FIGURE 12