

USDA-FOREST SERVICE

FS-2500-8

Date of Report: **September 23, 2009**

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

1. Funding request for estimated emergency stabilization funds
 2. Accomplishment Report
 3. No Treatment Recommendation

B. Type of Action

1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
 2. Interim Report
 Updating the initial funding request based on more accurate site data or design analysis
 Status of accomplishments to date
 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Station FireB. Fire Number: CA-ANF-3622C. State: CAD. County: Los AngelesE. Region: 5F. Forest: AngelesG. District: Los Angeles River, San Gabriel River, Santa Clara/Mojave RiversH. Fire Incident Job Code: P5E5VLI. Date Fire Started: August 26, 2009J. Date Fire Contained: TBD (pending winter rains)K. Suppression Cost: \$86,967,661 as of 09/23/09

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): 110 total miles of dozer line (46 on FS land)
2. Fireline seeded (miles): None to date
3. Other (identify): None

M. Watershed Number: M. Watershed Number: **HUC 6:** 180701050201 (Pacoima Wash), 180701050103 (Lower Big Tujunga Canyon), 180701050102 (Middle Big Tujunga Canyon), 180701050101 (Upper Big Tujunga Canyon), 180701050202 (Verdugo Wash), 1807010503992 (Arroyo Seco), 180701050402 (Eaton Wash), 180701050102 (Middle Big Tujunga Canyon), 180701060101 (Upper West Fork San Gabriel River), 180701060102 (Middle West Fork San Gabriel River), 180701020101 (Aliso Canyon), 180902060406 (Little Rock Reservoir), 180902060402 (Little Rock Creek), 180701020102 (Soledad Canyon-Arrastre Canyon), 180701020103 (Lower Soledad Canyon)

N. Total Acres Burned: 161,189

NFS Acres (154,431, 96%) Other Federal (50, 0.0003%) State () Private (6,750, 4%)

O. Vegetation Types: Dominant vegetation types in the burned area consist primarily of shrubland, including lower montane mixed chaparral, ceanothus chaparral, scrub oak chaparral, chamise chaparral, upper montane mixed chaparral, desert transition chaparral, and soft scrub mixed chaparral. Upper slopes contain canyon live oak, interior mixed hardwood, and coast live oak vegetation, transitioning into bigcone Douglas-fir, ponderosa/Jeffrey pine, and mixed conifer vegetation. Single-leaf pinyon occurs on the north side of the burned area, and planted ornamental conifers are scattered throughout. Stream corridors contain riparian mixed hardwood, white alder, willow, cottonwood, and California sycamore vegetation types.

P. Dominant Soils: In descending prevalence: Xerorthents (Chilao, Trigo, Typic & Lithic), Xeropsamments (Pismo, Pacifico) and Haploxerolls (Caperton, Tollhouse).

Q. Geologic Types: San Gabriel Mountains geologic units within the Station Fire are predominantly Precambrian to Miocene granitic rocks, anorthosite, gabbro, amphibolite, granodiorite and others, and subordinate metamorphic rocks, mostly gneiss. They are heavily influenced by major and minor fault zones, often highly fractured and weathered. Canyon bottoms and mountain fronts frequently display Quaternary older alluvial deposits forming elevated, dissected terraces.

R. Miles of Stream Channels by Order or Class: Perennial Channels = 81 miles, Intermittent Channels = 572 miles, Artificial Channels = 5 miles (Stream Order 2 = 43.7 miles, Stream Order 3 = 169.2 miles, Stream Order 4 = 235.5 miles, Stream Order 5 = 132.5 miles, Stream Order 6 = 60.4 miles, Stream Order 7 = 10.4 miles, Stream Order 8 = 0.5 miles)

S. Transportation System

Trails: 223 miles USFS Trails Roads: 133 miles USFS Roads

PART III - WATERSHED CONDITION

A. Burn Severity by total and FS (acres derived from GIS):

Non Forest Service	High	198
	Moderate	3,574
	Low	1,823
	Unburned	1,162
USDA Forest Service	High	16,738
	Moderate	97,063
	Low	23,594
	Unburned	17,036

B. Hydrophobic Soils: Water repellency is present throughout the fire area, including unburned areas. Severity and continuity of is slightly higher in the moderate and high soil burn severity classes, but not dramatically unchanged from unburned condition. Overall, about 80,600 acres (50%) of the fire area has water repellent characteristics, with moderate severity of water repellency at one half to four inches thickness.

C. Soil Erosion Hazard Rating: Very High – 81,397 acres
 High – 31,162 acres
 Moderate – 32,074 acres
 Low – 13,058 acres
 No Data – 2,109 acres

D. Erosion Potential:

ERMiT modeled erosion potential in tons/acre

	2	10	16
	10	36	59
	8	26	44

The ERMiT model is storm event based; outputs represent a single event rather than over-winter. Model accuracy assumes +/- 50%.

E. Sediment Potential: Steep linear slopes and steep stream gradients in the burned area result in virtually 100% erosion potential. Relic alluvial fans are deeply incised, and are not functioning as depositional features.

F. Debris Flow Potential: Debris-flow probabilities greater than 80 percent were calculated in response to short, high-intensity storms and longer, lower intensity storms for many of the tributaries to Big Tujunga Canyon, Pacoima Canyon, Arroyo Seco Canyon, West Fork of the San Gabriel River and Devils Canyon. This indicates the potential for significant debris-flow impact both in these drainages and downstream from the drainage area. Along the southern front, calculations for Haines, Cooks, Dunsmore, Pickens and Hall Beckley Canyons and four small watersheds immediately east of Arroyo Seco consistently yielded both high probabilities of occurrence and expected volumes greater than 100,000 cubic meters under short, high intensity storms.

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period, (years): 3 - 5
- B. Design Chance of Success, (percent): 80%
- C. Equivalent Design Recurrence Interval, (years): 2
- D. Design Storm Duration, (hours): 12
- E. Design Storm Magnitude, (inches): 3.6
- F. Design Flow, (cubic feet / second/ square mile): 10.5
- G. Estimated Reduction in Infiltration, (percent): 26
- H. Adjusted Design Flow, (cfs per square mile): 13.3

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The Station Fire occurred within the San Gabriel Mountains in the Transverse Range of California, Los Angeles County, California. The burned area is roughly bounded on the east by Interstate 5, to the south by foothill communities from Pacoima to Altadena, north by Antelope Valley foothills and in the east by lands managed by the Angeles National Forest. The Fire burned a total of 161,189 acres, of which 16,678 acres (10%) were within the Pleasant View and San Gabriel Wilderness areas. A total of 154,431 (96%) acres burned on National Forest System (NFS) lands and 6,758 (4%) acres burned on non-forest lands. The team assessed both the National Forest System (NFS) lands as well as the private lands burned by the fire. Approximately 73 percent of the entire burn was mapped as having a moderate and high soil burn severity (62% moderate and 11% high). The burn pattern of the fire was such that majority of the fire area burned at moderate soil severity. Soils on north facing slopes and small, discontinuous portions of the fire area have high soil burn severity characteristics. Areas with unburned and low soil burn severity fall within some drainage bottoms, along the fire perimeter and in the east portion of the fire area. See Soil Burn Severity Map in the Project File.

Summary of Watershed Response

The San Gabriel Mountains are some of the most tectonically active and rapidly uplifting mountains in the United States. The forces lifting the mountains to great heights are being counteracted by erosive forces tearing them down, such as gravity, moving water, wind, earthquakes and human activities. When the Station Fire removed vegetative cover and burned surface soil structure, slopes and channels became even more unstable than normal. Dry ravel has already increased dramatically across the entire burned area, and is adding large volumes of loose sediment to ephemeral channels and creek bottoms. Rocks which have lost their supporting vegetation on steep slopes have already started to roll down to roadways or canyon bottoms, or to places where they are stopped by obstructions or gentler slopes. Groundwater which previously fed vegetation is now surfacing as seeps and springs on some slopes and in canyon bottoms, and may initiate slope movements in some areas, even before the arrival of winter rains.

Deep seated rotational landslides and earthflows are relatively few in these mountains, but could occur in deep saturated slopes, especially if shaken by an earthquake. Many earthquake faults crisscross and border these mountains, and quakes could significantly increase all types of slope movements when slopes are saturated. Thin surficial slides and deeper translational debris slides will increase due to the destruction of soil structure and loss of root support.

The most dramatic geologic hazard response to the fire will be the increase in destructive debris flows which bring sideslope and channel deposits racing down channel bottoms in a slurry similar to the consistency of concrete, in masses from a few hundred cubic yards to hundreds of thousands of cubic yards of saturated material, destroying everything in its path until it finally loses its momentum or is caught in a debris catchment basin. An emergency assessment of post-fire debris flow hazards for the Station Fire by the U.S. Geological Survey concluded that the Combined Relative Debris-Flow Hazard Rankings calculated in response to the 3-hour-duration storm were either "high" or "severe" for all but 18 of the 678 basins evaluated within the burned area. The 12-hour-duration storm resulted in either "moderately high", "high", or "severe" rankings for all but 25 of the basins. The large number of basins with "high" or "severe" rankings that drain into Big Tujunga Canyon, Pacoima Canyon, Arroyo Seco, West Fork of the San Gabriel River, and Devils Canyon indicates the potential for significant debris-flow impact both in these drainages and well downstream from the burned area. The USGS report concludes that "when compared with similar evaluations for past fires, this is the greatest number of basins we have seen with such high [debris-flow] probabilities."

The Station Fire burned approximately 161,000 acres in the northeastern extent of Los Angeles Basin and adjoining basins. Vegetation is mostly shrub and chaparral with minor inclusions of forested ecotypes. Soils are dominantly coarse textured, shallow, and occur on steep to very steep slopes, rendering them naturally erodible. Geomorphic erosion rates are high, perpetuating shallow coarse soils, especially with pulse erosion following fire as a natural long-term process in this mountain region. Cover is critical for soil stabilization, and is lacking throughout most of the fire area.

Assessment teams found the overall soil burn severity to be 11% unburned and very low, 16% low, 62% moderate, and 11% high. Soils with low burn severity still have good surface structure, contain intact fine roots and organic matter, and should recover in the short-term once revegetation begins and the soil surface regains cover. The moderate to high classes have evidence of severe soil heating in isolated patches; these areas have long-term soil damage and high to very high erosion hazard. The most severely burned slopes occur on steep slopes at higher elevations and mostly on north aspects where pre-fire vegetation density and fuels accumulations were higher. Water repellency is present throughout the fire area, including unburned areas, and was only moderately exacerbated in the hotter burn areas. Eroded soil, by ravel or water, provides the materials for damaging debris flows and stream bulking.

The Station Fire burned fourteen 6th field watersheds within the Los Angeles River, San Gabriel River, Antelope-Fremont Valley, and Santa Clara River 4th field watersheds. The 6th field watersheds were divided into sub-watersheds with “pour points” established at the mouth of creeks, river, or canyons. Pour points are located one tenth to 3 miles below the edge of the burn depending on where the values at risk are located downstream. Pre fire and post fire runoff and sediment yield is referenced for both the 6th field watersheds and at each pour point.

In the Station Fire, 51% of the slopes are greater than 50%, 36% of the slopes are 25-50%, and 13 % of the slopes are less than 25%. The steeper slopes will yield the greatest quantities of sediment during moderate to heavy storms. Most of the steepest areas burned at moderate to high soil severity. Hydrophobic conditions and lack of vegetation cover in the moderate and high burn soil severity will increase the watershed response.

The following 6th field watersheds have 50% or more of the watershed burned: Pacoima Wash (70%), Low Big Tujunga Canyon (53%), Middle Big Tujunga Canyon (95%), Upper Big Tujunga Canyon (64%), Arroyo Seco (63%), and Upper West Fork San Gabriel (72%). The following 6th field watersheds have less than 50% of the watershed burned: Verdugo Wash (22%), Eaton Wash (6%), Middle West Fork San Gabriel (2%), Aliso Canyon (35%), Little Rock Reservoir (24%), Little Rock Creek (11%), Soledad Canyon/Arrastre Canyon (22%), and Lower Soledad Canyon (18%). Watersheds with the greatest area burned will have the largest watershed responses.

The 2 year/12 hour storm event was considered the “design storm” for the purpose of evaluating effects. Runoff response and sediment yields vary from watershed to watershed. The Middle Big Tujunga Canyon is one of the higher output watersheds with a 24.9 x normal (pre-fire) sediment yield and 4.3 x normal (pre-fire) runoff response for a 2 year storm event. The Little Rock Creek is the lowest output watersheds with a 2.6 x normal (pre-fire) sediment yield and 1.1 x normal (pre-fire) runoff response for a 2 year storm event. Additional observations and detailed findings can be found in the Geology, Soils, and Hydrology Specialist Reports.

Values at Risk

The following values were identified during the initial phase of the Station Fire BAER assessment process as “at risk” from post-fire watershed effects that include increased runoff and debris flows, rock and debris fall, erosion and sedimentation, and landslides:

Life: There is a substantial risk to Forest visitors using dispersed recreation sites, State Highway 2, Big Tujunga Road, Angeles Forest Highway, Mt Wilson Road, Mt Gleason Road, level two roads, trails, campgrounds and administration sites on NFS lands as well as facilities on non-federal land both within and outside the Station Fire perimeter, and communities in close proximity to the southern portion of the Station Fire perimeter. Government employees whose duty stations and government housing facilities are within the burned area such as Angeles Crest, Clear Creek, Big Tujunga, Oak Grove and other stations are also at risk. Exposed mine sites may also pose a risk to dispersed recreationist who can now access these sites because of the loss of brush cover.

Property: There are approximately 223 miles of National Forest System Road (NFSR) with in the Station Fire perimeter, with additional mileage adjacent to or below the burned watershed that could be affected. The dominant road features on the landscape are Rincon / Red Box (2N24), Josephine Peak (2N64), Mount Lukens (2N76), Santa Clara Divide (3N17), Mount Gleason (3N17N), and Magic Mountain (4N46) Several camp grounds, picnic areas, private inholdings, special use permitted camps, recreation residence tracts, wilderness areas and trail heads, ski areas, communication sites, and major power lines and a flood control reservoir within the burn area are accessed by the road system. Many water collectors for wildlife (guzzlers) are at risk of washing out or losing pipes from erosion.

There are approximately 133 miles of non-motorized trails impacted by the Station Fire. Significant NFS trails within the burned area include approximately 25 miles of the Pacific Crest National Scenic Trail, 19 miles of the Gabrieleno National Recreation Trail and approximately 11 miles of the Silver Moccasin National Recreation Trail, in addition to portions of the West Fork San Gabriel River Scenic Bike Trail. Trails in the southern portion of the burned area are in close proximity to major urban areas and are highly used by visitors and local residents even during the current burned area closure.

Angeles Crest Fire Station and Monte Cristo Fire Station as well as other Forest Service administrative sites are at risk of damage to structures and water lines from flooding. Many campgrounds, picnic areas, and work stations are also considered at risk. The infrastructure and facilities are a government asset and are needed for long term administrative, emergency, permittee, recreation, and inholder access during and after the fire recovery period.

In addition to the above values, the following assets are at risk: State Highway 2 (Angeles Crest Highway), Angeles Forest Highway, Big Tujunga Canyon Road, Little Tujunga Canyon Road, Sand Canyon Road, Aliso Canyon Road, Mount Wilson Road and Zachau

Canyon Road, reservoirs, and private property within and outside of NF boundary due to increased postfire watershed response (increased flows and sediment, high debris flow potential). For more information see the Hydrology and Geology Specialist Reports in the project record.

Water Quality and Quantity: The most noticeable effects on water quality will be increased sediment and ash from the burned area into Little Rock Reservoir (drinking water source for Palmdale) and other waterbodies in and downstream of the fire area. During storm events this will increase turbidity and contribute to pool filling. Increased nitrogen may occur during the first year after the fire but levels are not expected to change appreciably in the Littlerock Reservoir because only a small percentage of the watershed burned. Natural recovery is the recommended treatment. Ash may also impact water quality and public health.

Burned buildings, facilities, water tanks, shops, and equipment storage sites pose a threat to water quality from the release and mobilization of associated toxic chemicals such as gas, oil, and building materials. The BAER team identified 11 hazardous material sites that were severely burned and analyzed their potential to be transported during rain events. Septic tanks and outhouses in the burned area could also flood during high flows and pollute streams.

These threats to water resources will be the most acute during the first post-fire rainy season from December through February and then decline in severity over the next three to five years as the chaparral recovers, given adequate rainfall. For more information see the Hydrology and Hazmat Specialist Reports in the project record.

Threats to Soil Productivity: There is no effective BAER treatment for soil productivity. The soils impacted by the Station fire support a fire-adapted ecosystem.

Threats to Cultural Resource: Many archaeological sites exist within the Station Fire burn perimeter. The historic sites include structures, organizational camps, mines, homesteads, and trash scatters. The prehistoric sites include rock art, habitation camps, earthovens, bedrock mortars, and lithic manufacturing remains. Most of the sites sustained a complete loss of vegetation and are susceptible to minor slope wash. Seven sites are found to have values at risk, five of which will need emergency treatments to stabilize and protect those values.

Threats to Wildlife: The area affected by the Station Fire supports important habitats and occurrences of federally threatened and endangered species along with their designated critical habitat. Federally listed threatened and endangered species that could be affected by the Station Fire include the following:

- California condor
- Least Bell's vireo
- Santa Ana sucker
- Unarmored threespine stickleback
- Mountain yellow-legged frog
- Arroyo toad

Designated critical habitat occurs for the following species:

- Santa Ana sucker
- Mountain yellow-legged frog

There are also a number of Forest Service Region 5 Sensitive species that may occur in the area and/or have suitable habitat that is affected by the Station Fire. These include the following:

- Santa Ana speckled dace
- Arroyo chub
- Western pond turtle
- Two-striped garter snake
- San Diego horned lizard
- Coastal rosy boa
- San Bernardino mountain kingsnake
- San Bernardino ringneck snake
- California legless lizard
- California spotted owl
- Nelson's bighorn sheep

- Western red bat
- Pallid bat
- Townsend's big-eared bat

Emergency conditions exist for all of the above listed federally threatened and endangered species or their habitat as a result of anticipated post-fire results. For aquatic species, post-fire impacts will include compromised water quality and changes in water chemistry due to ash delivery and hazardous materials, changes in water temperature from loss of canopy shading, scouring of riparian/aquatic vegetation and changes in streambed/pool habitat due to debris flows and sediment delivery and flushing of species during flood events downstream. These combined impacts may lead to a temporary loss or reduction of suitable stream habitat and localized extirpation of special status species populations. The Santa Ana sucker, speckled dace, arroyo chub, and mountain yellow-legged frog have been identified as being at risk of experiencing extirpation of small isolated occurrences. Extirpation of these occurrences is a critical risk that could result in a threat to viability of these species. Post-fire events may facilitate the spread of non-native aquatic species into previously unoccupied habitats. For all species, there is a concern that until enough vegetative recovery has occurred to deter illegal off-road vehicle travel, habitat degradation will continue. Increased access and visibility due to lack of vegetative cover will result in habitat degradation, disturbance of species, and increased risk of collection for some species (turtles, fish, etc.). For California condors, there is an increased threat of injury/death due to ingestion of microtrash.

Native Vegetation Recovery: Natural regeneration of coniferous and chaparral communities in areas of high soil burn severity will occur slowly, because mature conifers capable of reseeding coniferous stands were killed and climate conditions that define local ecosystems do not facilitate rapid regrowth after exposure to high intensity fire. Recovery and ecological sustainability of the native vegetation within the entire burned area is at risk from invasive weed introduction and population expansion. Areas of ground disturbance (i.e. dozer lines) and regular equipment or crew presence (i.e. staging areas, safety zones, drop points) during suppression operations created a risk of invasive weed introduction, establishment and proliferation. Invasive weed populations known prior to the Station Fire event will increase in the burn area due to naturally accelerated growth rates, high reproduction capabilities, and release from competition with natives. These weed populations could affect the structure and function of native plant communities within the burn area and population expansion will weaken watershed integrity and soil stability, as well as threaten native wildlife habitat. It is expected that most native vegetation would recover over time if noxious weed competition and expansion are minimized.

Rare Plants: Field survey findings, reference material and professional experience indicate sensitive plant populations will experience moderate to major post-fire threats as a result of the Station Fire. Burn severity and high potential for post-fire unauthorized OHV traffic threaten rare plant populations in the fire area.

Summary of Critical Values and Resources

Life & Safety	Increased runoff and debris flows, rock and debris fall, erosion and sedimentation, and landslides.	Users of National Forest roads, trails, campgrounds and administration sites; users of major county and state roads, public use of roads, trails, campgrounds, and facilities and homes on non-federal land both within and outside the Station Fire perimeter.	Yes
Property	Increased runoff and debris flows, rock and debris fall, erosion and sedimentation, and landslides. Increased threat of vandalism related to loss of vegetation.	Forest Service roads and trails, recreation infrastructure (i.e. campgrounds) and recreation residences in some locations, Forest Service fire stations and work centers, spring developments that provide critical water source for wildlife. Private homes, reservoirs, and facilities within and outside of the National Forest. State and County roads, highways, utilities, and infrastructure.	Yes
Water Quality	Increase in sediment and ash delivered to the facility.	Water supply for the City of Palmdale is located in the Little Rock watershed at Little Rock Reservoir.	No

	Burned guard station debris and hazardous materials from illegal plantations.	Beneficial use of water.	Yes
Soil Productivity	Increased runoff and debris flows, rock and debris fall, erosion and sedimentation, and landslides.	There is no emergency to soil productivity due to fire-adapted ecosystems.	No
Heritage Resources	Looting and vandalism due to exposure and stability due to minor slope wash potential.	Integrity of Heritage sites.	Yes
Plant Communities	Loss of habitat and landscape biodiversity.	Rare plant species.	Yes
Ecosystem Structure and Function	Post-fire weed introduction and spread.	Natural vegetative recovery, watershed integrity and soil stability.	Yes
Wildlife & Fisheries Resources	Increased scouring and debris flows resulting in changes to channel morphology, lowered water quality, and erosion of streambanks and associated riparian vegetation. Dispersal and increased competition with non-native fauna. Ingestion of microtrash.	Designated Critical Habitat for: <ul style="list-style-type: none"> • California condor (federally-endangered) • Santa Anna sucker (federally-threatened) • Mountain yellow-legged frog (federally-endangered) • Least Bell's vireo (federally-endangered) • Unarmored threespine stickleback (federally-endangered) • Arroyo toad (federally-endangered) 	Yes

The rapid assessment method and short reporting deadline required by the BAER program did not permit the BAER team to evaluate all the threats at site specific locations, given the complexity of values at risk within and downstream of the burned area. However, the BAER Assessment Team worked with cooperating agencies through interagency meetings to identify general initial concerns and information needs, discuss potential treatment recommendations, and discuss the draft BAER report. These meetings helped the BAER team identify general areas of downstream values at risk, and consider treatment options for NFS lands.

Given the predicted effects of the fire on the watershed, all of the resources listed above are at serious risk of mud, flood, and debris flow should a storm occur within the burned area.

B. Emergency Treatment Objectives

As noted above, the greatest threats are to life and property from increased erosion and sedimentation, flooding potential, and increased debris flow potential. For these reasons the primary treatment objectives are to minimize loss of life and risk to human safety, and minimize threats to property. Other treatments are identified to reduce the risk of degradation of significant natural resources including the potential spread of noxious weeds, and protection of cultural resource sites.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:

Land 90 % Channel -- % Roads/Trails 90 % Protection/Safety 90 %

D. Probability of Treatment Success

The proposed treatments on National Forest System lands can help to reduce the impacts of the fire from storm events, but treatments can not fully mitigate the effects of the fire on the watershed. Detailed information of the treatments summarized below can be found in the specialist reports prepared in support of this funding request.

The BAER team considered and analyzed construction of major debris dams, check dams, and other infrastructure on NFS lands. The team found that these types of treatment would not be appropriate because of the excessively steep slopes within the burn perimeter coupled with projected highly responsive watershed events triggered by even modest rain. Hillslope treatments (such as hydromulching, aerial seeding, and straw application) were not proposed because they are infeasible and/or would not reduce the probability of damage to assets. For more information see the Hydrology Specialist Report and the Soil Specialist report. Other treatments that were considered but not carried forward are identified in the Project File.

The treatments listed below are those that are considered to be the most effective on National Forest System lands given the local setting including topography and access:

LAND

- o Noxious Weed Detection Surveys
- o Unauthorized Access Vegetative Screening
- o Condor Protection and Removal of Microtrash

ROADS/TRAILS

- o Road Treatments
- o Trail Evaluation and Implementation

PROTECTION/SAFETY

- o Interagency Coordination/Implementation Team
- o Human Life and Resource protection (Fire Area Closure)
- o Hazardous Material Stabilization
- o Structure Protection
- o Hazard Tree Mitigation
- o Abandoned Mine Closure
- o Special Status Species Salvage
- o Arroyo Toad Protection
- o Cultural Resource Site Protection
- o Protection Enforcement
- o Treatment Effectiveness Monitoring

Years after Treatment: This refers only to NFS lands, not all lands downstream
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	1	3	5
Land	70	80	100
Channel	n/a	n/a	n/a
Roads/Trails	50	80	90
Protection/Safety	80	80	90

E. Cost of No-Action (Including Loss): See Project File: Summary of cost-risk analysis.

F. Cost of Selected Alternative (Including Loss): See Project File: Summary of cost-risk analysis.

G. Skills Represented on Burned-Area Survey Team:

- | | | | | |
|---|--|---|---|--|
| <input checked="" type="checkbox"/> Hydrology | <input checked="" type="checkbox"/> Soils | <input checked="" type="checkbox"/> Geology | <input type="checkbox"/> Range | <input checked="" type="checkbox"/> Public Information |
| <input checked="" type="checkbox"/> Forestry | <input checked="" type="checkbox"/> Wildlife | <input type="checkbox"/> Fire Mgmt. | <input checked="" type="checkbox"/> Engineering | <input checked="" type="checkbox"/> Inter-agency coordinator |
| <input type="checkbox"/> Contracting | <input checked="" type="checkbox"/> Ecology | <input checked="" type="checkbox"/> Botany | <input checked="" type="checkbox"/> Archaeology | <input checked="" type="checkbox"/> NRCS |
| <input checked="" type="checkbox"/> Fisheries | <input checked="" type="checkbox"/> Research | <input type="checkbox"/> Landscape Arch | <input checked="" type="checkbox"/> GIS | |

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Core Team Members:

- Carly Gibson – Co-team Lead (T)
- Jerry DeGraff - Geologist
- Allen King – Geologist
- Jonathan ‘Yonni’ Schwartz – Geologist (T)
- Dave Young – Soil Scientist
- Terry Hardy – Soil Scientist
- Jason Jimenez – Soil Scientist
- Eric Nicita – Soil Scientist
- Brad Rust – Soil Scientist/Hazmat
- Joe Gonzales – Hazardous Materials Specialist
- Mary Moore – Hydrologist
- Kyle Wright – Hydrologist (T)
- John Thornton – Hydrologist
- Chris Stewart– Hydrologist
- Tim Biddinger – Hydrologist
- Jeff TenPas – Interagency Liaison
- Cathleen Thompson – Public Information Officer
- Richard Hadley – Public Information Officer (T)
- Ron Ashdale – Safety
- Cliff Johnson – Lands/Engineering
- Rusty LeBlanc – Roads Engineer
- Randy Nagel – Roads Engineer
- Eric Martindale - Roads Engineer
- Keith Stockmann – Economic Analyst
- Brad Burmark – Economic Analyst
- Lisa Northrop – Forest Liaison/BAER Coordinator
- Janet Nickerman – Botanist
- Joanna Clines – Botanist
- Krissy Walker – Botanist
- Kerry Meyers – Botanist (T)
- Tommy Stoughton – Botanist (T)
- Jan Beyer – Ecologist/Botanist
- Robin Eliason – Wildlife Biologist
- Steve Loe – Wildlife Biologist
- Leslie Welch – Wildlife Biologist
- Angelica Mendoza – Wildlife Biologist
- Tom Murphey – Wildlife Biologist
- Meghan Pawlowski – Wildlife Biologist
- Dan Teater – Fisheries
- Rusty LeBlanc – Roads Engineer
- Kelli Brasket – Archaeologist
- Dave Peebles – Archaeologist
- Jeremy Haines – Archaeologist
- Nolan Smith – Archaeologist
- Doug McKay – Archaeologist
- Mark Schug – Geographic Information Systems Specialist
- Jordan Zylstra – Geographic Information Systems Specialist
- Lauren Miller – Geographic Information Systems Specialist (T)
- Keith Stockmann – Economist
- Brad Burmark – Economist
- Brent Roath – R5 BAER Coordinator

(T) indicates trainee

Adjunct Team Members:

- Phil Eisenhauer - Silviculture
- Steve Bear – Silviculture
- Sue Cannon – Geologist (USGS)
- Charlie Luce – Research Hydrologist
- Terry Kaplan-Henry – Hydrologist
- Sarah Reid – Office Support
- Andy Bidwell – Google Earth Technical Specialist
- Andrew Pattison – Google Earth Technical Specialist
- Atlanta NIMO Team
- Carey Crist - Geographic Information Systems Specialist

H. Treatment Narrative

The proposed treatments on National Forest System lands can help to reduce the impacts of the fire from storm events, but treatments can not fully mitigate the effects of the fire on the watershed. Detailed information of the treatments summarized below can be found in the specialist reports prepared in support of this funding request.

The BAER team considered and analyzed construction of major debris dams, check dams, and other infrastructure on NFS lands. The team found that these types of treatment would not be appropriate because of the excessively steep slopes within the burn perimeter coupled with projected highly responsive watershed events triggered by even modest rain. Hillslope treatments (such as hydromulching, aerial seeding, and straw application) were not proposed because they are infeasible and/or would not reduce the probability of damage to assets. For more information see the Hydrology Specialist Report and the Soil Specialist report. Other treatments that were considered but not carried forward are identified in the Project File.

The treatments listed below are those that are considered to be the most effective on National Forest System lands given the local setting including topography and access.

Land Treatments

Noxious Weed Detection Surveys: Surveys will begin in 2009 during the resprouting and flowering periods of weed species. Because of differences in flowering times for all potential species, two visits may be required during the growing season. Completion of surveys in riparian areas, dozerlines, and known pre-existing invasive and sensitive plant populations would be the first priority. There were 46 miles of dozer lines on NFS lands. The second survey priorities would be along roads, handlines, and staging areas. Herbicide application would be used in Big Tujunga Canyon utilizing an existing environmental assessment. Detailed weed detection survey guidelines are attached in the Project File.

Unauthorized Access Vegetative Screening: Unauthorized recreational activity, including operation of off-highway vehicles, horseback riding, hiking, mountain biking, and other ground disturbing activities are a threat to National Forest System land. Erosion, spread of invasive species, damage to cultural sites, disturbance to wildlife, destruction of wildlife habitat, impaired water quality, and risks to public safety can result from unauthorized access. Utilize cut vegetation from fuel reduction projects to screen areas denuded of vegetation along roads known for high unauthorized access.

Condor Protection and Removal of Microtrash: Reduce the potential for condors, an Endangered species, to consume microtrash debris. Sites with a concentration of microtrash pose a risk for condors. The fire has removed vegetation and exposed areas where microtrash is now easily accessible by foraging condors. The primary treatment for removal of microtrash is manual clean-up of the site. The sites included for treatment include Mount Lukens, Mount Gleason, and Magic Mountain communication sites.

Channel Treatments

None recommended.

Road and Trail Treatments

Treatment Objectives: Minimize risk of road and trail failure in the burn area through the placement and maintenance of effective water control measures. Prevent the channeling of water on roads and trails. Ensure the diversion of runoff in controlled intervals to reduce erosion and further watershed degradation.

Road Treatments: A determination was made that BAER treatments are required on Forest Service roads 2N24 (Rincon/Red Box), 2N50 (Mt. Lowe), 2N64 (Josephine Peak), 2N65 (Millard Canyon), 2N66 (Brown Mountain), 2N68 (Rising Hill), 2N76 (Mt. Lukens), 2N79 (Grizzly Flat), 3N17 (Santa Clara Divide), 3N29 (Gold Creek), 3N30 (Yerba Buena), 3N32 (Mendenhall Ridge), 3N38 (Doane Ebey), 3N43 (Doane Canyon), 3N55 (Monte Cristo Station), 4N33 (Moody Canyon), and 4N37 (Indian Canyon), and others. For more information see the Roads Specialist Report in the project record.

The following treatments were identified as BAER treatments for the Station Fire burned area:

- Complete Roads Assessment
- Install Roadway Relief Dips.

- Install Vertical Riser CMP (snorkel).
- Install Drainage Armor (riprap rock).
- Install Overside Drains with Flumes.
- Drainage Structure Cleanout (trash racks, catch basins, overside drains, sediment basins).
- Storm Response
- Storm Monitoring

Trail Evaluation and Implementation: The BAER Assessment Team has prescribed non-motorized trail treatments including improvements to existing water drainage structures to protect the trail infrastructure from failure and increased sediment flow. Prior to implementation of treatments, a crew will perform trail surveys on identified trails. The result of the survey will dictate subsequent detailed storm proofing treatment recommendations. These treatments are the minimum necessary trail work activity which will protect the trail investment in its current state and protect it from the expected seasonal weather. The four prescribed treatments include:

1. Clearing and improving erosion control structures on the trail treads,
2. Out-slope trail tread and remove berm to allow passage of water and soil,
3. Clear and improve locations on the trails where ephemeral streams cross the tread,
4. Armor spillways with native materials where needed.

Protection/Safety Treatments

BAER Implementation/Interagency Coordination Team: This effort involves communication and coordination with other federal, state, and local agencies with jurisdiction over adjacent lands and inholdings where life and property are at risk from post-fire conditions. Actions include but are not limited to working and coordinating with other agencies on hazard notification systems; permitting the siting of rain gages and soil moisture instruments to monitor conditions within the burn area (in support of National Weather Service forecasts); and exchanging information and coordinating the BAER implementation plan with subsequent recovery plans developed by other agencies.

The initial cost request for this effort includes the management structure as identified below for implementation of the 2500-8. Additional coordination needs may ensue, costs for which will need to be requested on an interim 2500-8.

Over the next 3 years it is critical that appropriate agencies maintain due diligence and continue to inform the public of the potential hazards resulting from post-fire watershed response. A comprehensive joint interagency information and public outreach program, known as the *Coordinated Agency Recovery Effort (C.A.R.E.)*, has been established to provide consistent information dissemination regarding postfire stabilization and recovery. The focus of these efforts are on the 23 communities and municipalities adjacent to the Forest that could potentially be impacted by mud or debris flows.

Human Life and Resource Protection (Fire Area Closure): To support the Forest closure order and ensure safety for Forest visitors and protection to Forest resources during the recovery period, gates and closure/warning signs will be placed at trailheads, campgrounds, picnic areas, trail, and road locations adjacent and within the fire perimeter. Site specific location such as Forest roads need to be evaluated annually, to prioritize areas identified as possibly requiring extended closure to protect Federally listed species and associated habitats.

Forest Infrastructure: To protect life and property associated with the public use of the non-motorized hiking trails, campgrounds, picnic areas, and trailheads within and downslope/downstream of the Station Fire, the BAER Assessment Team recommends the temporary, seasonal closure of the burn area to all recreational users. The closures will be accomplished by gate closures and informing the public at strategic locations of access points outside and within the fire perimeter which will effectively close off the burn area.

Road Closure: Gates will be installed at specific locations on the Forest to implement the closure. Precise locations (GPS Latitude/longitude coordinates) are being generated through coordination with the Forest Engineer and District Rangers. A map with proposed gate locations is included in the project record. A boulder barrier will be placed at specific sites where gates and fencing have proven to be ineffective. Boulder barriers are proposed at Fall Creek Road, Mendenhall Road and Military Road at Aliso Canyon.

Hazardous Material Stabilization: A total of 11 sites were severely burned and destroyed with the possibility of easily mobilized toxic chemicals. Most sites have concrete floors surrounded by dirt grades. With heavy rainfall these building foundations will retain 4 to 6 inches of water before spilling out on to the dirt grades and slopes below. It is also recommended that septic tanks and vault toilets are pumped to reduce the potential of sewage being released into the streams. If additional sites are located, an interim request may be submitted for additional stabilization funding. The Forest should continue to expedite removal of hazardous materials.

Structure Protection:

The following treatments are designed to reduce the potential for damage to properties and associated infrastructure.

Erosion and Flood Control: Accelerated hillslope runoff has the potential to flood a diversion channels and deliver sediment at the following Forest Service Administrative Sites: Clearcreek, Arroyo Seco, Shortcut, Angeles Crest, and Monte Cristo. Sandbagging, k-rails, and woodstraw mulch are proposed to reduce overland flow and protect Forest Service assets.

Rock Fall Catch Fences and Mulching: A design combining k-rails and chainlink fencing is proposed to mitigate rock fall and sheet erosion damage to property, and to increase personal safety. Catch fences would be located adjacent to 6 recreation residences (2 each in the Trail Canyon tract, La Paloma tract, and Millard tract). Woodstraw mulching is proposed to minimize nuisance sheet erosion that is expected to deliver sediment to the lots and residences.

Erosion and Flood Control: Accelerated hillslope runoff has the potential to flood a diversion channel and deliver sediment into six (6) recreational residences at the Delta Flats Recreation Residence tract. Woodstraw mulch is proposed to reduce overland flow and increase channel stability.

Debris Flow and Flood Control: There is a high potential for debris flows and flooding to damage three (3) recreation residences in the Big Tujunga tract. The proposed treatment is to construct a protective barrier that would tie into an existing high flow retention wall. Coordinate flood control operations with NRCS for downstream values at risk.

Hazard Tree Mitigation: This treatment will ensure threats to the life and safety of Forest visitors have been properly mitigated after the Forest closure order is rescinded. The objective of this treatment is to fell hazardous trees from high-use areas where people are likely to congregate and be stationary for extended time periods. This treatment is also necessary to remove threats having a high probability of damaging property. These locations include Forest Service roads, 23 campgrounds, 18 picnic areas, 9 trailheads, and 2 fire stations.

Abandoned Mine Closure: This treatment provides for public safety and resource protection by reducing the potential for the public to explore exposed adits, reducing the potential for exposure to chemical hazards, and protect bats and their habitat from vandalism and disturbance. Mines with high visibility have fencing installed around adits and signs installed warning the public of the potential hazards. If the fencing closure is not effective, or if additional sites are discovered, the Forest may request additional funding in an interim request.

Special Status Species Salvage: Severe post-fire watershed responses are expected to impact special status aquatic species and their habitat. For small and isolated populations of TES species (mountain yellow-legged frog, unarmored threespine stickleback, arroyo chub, Santa Ana sucker, and speckled dace), there is a risk of localized extirpations as a result of the exacerbated watershed response. Due to the steepness of the slopes, there are no treatments that would effectively reduce the potential for increased sediment and ash, or debris flows into the occupied habitat. Therefore, capture and removal of fish and frogs and translocation of individuals for 1-3 years until the watershed stabilizes enough to return individuals to the collection sites is recommended. This will be an interagency effort between USGS, USFWS, CDFG, USFS and other local partners. For the mountain yellow-legged frog, the proposal includes removal of individuals from Devil's Canyon with translocation into Little Rock Creek and/or placement in a holding facility such as the LA Zoo or Fresno Zoo (cost not covered under this treatment). Capture of fish from Big Tujunga Creek, Pacoima Wash, and Haines Creek would be accomplished through use of a USFWS permitted contracted consultant. The proposal includes removal of individuals and translocation to an appropriate drainage and/or placement into a holding facility such as the Whitewater Preserve.

Arroyo Toad Protection: There is a population of federally-endangered arroyo toads in Upper Big Tujunga, Alder Creek and Lynx Gulch. This population is in close proximity to the Upper Big Tujunga Canyon Road, Lynx Gulch Road and Alder Creek Road. As a result, this population is highly vulnerable to impacts associated with dispersed recreation use. The fire removed vegetation that previously created a visual screen and barrier. Vegetation that discouraged road shoulder parking was also removed by the fire. The concern is that post-fire recreation use and associated impacts will impact this small and isolated arroyo toad population and

increase the risk of extirpation. Installation of physical barriers to prevent parking along a 2.5 mile stretch of the Big Tujunga Canyon road would help reduce the potential for damage to occupied arroyo toad habitat. Earthen berms are recommended as the barrier and Los Angeles Department of Public Works will provide needed assistance for installation. Carsonite signs would be installed to advise the public of sensitive resource protection needs. Monitor effectiveness of parking restrictions. An interim funding request would be submitted if additional treatments are needed.

Cultural Resource Site Protection: The treatments described below are to reduce impact to archaeological sites from increased watershed response, exposure, and theft.

FS# 05015500042: The objective of this treatment is to minimize post-fire runoff from increased channelization through this archaeological site and by doing so, protect artifacts and subsurface features from erosion, exposure, and theft. The treatment of this site will consist of the creation of two rolling dips, to redirect water flow away from this site; berming road access and the problem channel along the road; placing straw wattles to slow water velocity within channels; wood straw mulch to provide ground cover and a micro-environment for returning vegetation.

FS # 05015500032: The site is part of a NRHP eligible rock art district and consists of cupule boulder rock art and a lithic scatter. The boulders with the cupule rock art are small, easily visible, and are now at risk for theft and vandalism. The site has been vandalized in the past. Treatment will consist of seeding and mulching the site to accelerate vegetative re-growth and will help keep the exposed artifacts and features from view. Native seed will be collected from the local area by botanists and then be hand scattered across the site. Wood straw will be hand applied to the site to stabilize the seeds until germination.

FS # 05015500163: This site consists of at minimum 5 discrete prehistoric thermal features (or earth ovens) that occur within the road prism. The drainage ditch has filled with sediment. Post fire conditions may lead to increased runoff and increased water velocity that may redirect water into the prehistoric thermal features. This will result in the exposure of subsurface deposits and artifacts, and would likely cause materials to erode down slope. At risk is the integrity of this NRHP eligible property, loss of data, and increased exposure of artifacts that may be looted. The treatment type will consist of the mechanical removal of accumulated sediment along a 200ft section of the road. An archaeological monitor should be present at the time of treatment, and subsequent archaeological monitoring for treatment effectiveness is strongly recommended. A bull-dozer is not recommended.

FS # 05015500095: The treatment of this site will consist of: the creation of 1 rolling dip, to redirect water flow away from this feature. Prior to construction/implementation, archaeological testing of the rolling dip should be performed. This testing would consist of the simple auguring of possible rolling dip placement areas to ensure that subsurface features or deposits will not be impacted by rolling dip construction.

Protection Enforcement: Unauthorized access is a threat to the burned watersheds. Erosion, spread of invasive species, damage to cultural sites, disturbance to wildlife, destruction of wildlife habitat, and risks to public safety can result from unauthorized access. The Angeles National Forest (ANF) is 70% of all open space in Los Angeles County serving a population of over 11 million. The ANF is the most urban Forest in the nation with one of the highest use levels. The challenge for the ANF is managing the high number of users who gain access unauthorized onto the forest from driving/riding/entering through or around a locked gate or closed sign. This type of unmanaged use can cause damage to natural and cultural resources. Due to increasing population and developments that border the forest, it is difficult to patrol unauthorized access.

Through past BAER experience, the ANF has determined that signage, gates, fencing, and other hard closures that are installed to discourage soil disturbance and assist in allowing natural vegetative recovery are not effective by themselves. Patrolling within and adjacent to the burn area is needed to enforce the closure and deter unauthorized access, vandalism, and damage to National Forest System lands.

Due to the size of the fire area and inability to install physical barriers over vast areas, funding for 7 GS-7, Level 2 FPOs is requested to patrol the burn area to ensure the Forest Closure Order is enforced.

I. Monitoring Narrative

This monitoring is specifically designed to answer the question: Are BAER treatments functioning effectively or is there a need to maintain, repair, or replace the treatment? The effectiveness monitoring efforts identified for the Station Fire include the following:

Road Treatment Effectiveness Monitoring: Monitor conditions and initiate corrective action, when safe to do so, during and after storm events, for risks such as flash flooding, rock fall, and debris flow clean up. Insure water flow through drainage facilities, including BAER

road treatments, clear blockages to restore drainage function for next storm. Include members from Assessment Team to monitor post-storm watershed response and impacts to systems roads.

Area Closure Effectiveness Monitoring: A two person crew will monitor the BAER treatments. The patrols will check signs, information boards, temporary fencing, gate closures. Enforcement Treatment effectiveness will also be monitored. See Monitoring Plan in Project File. Monitor abandoned mines to determine effectiveness of closures and level of use by the public. Evaluate to determine if installation of bat-friendly gates is appropriate. An interim funding request would be submitted if additional treatments are needed.

Heritage Resource Treatment Monitoring: Monitor the effectiveness of resource stabilization treatment after the first large storm event for sites: 05015500042, 05015500163, and 05015500095. Monitor the condition of site 05015500032 as protective vegetation resprouts and determine if site is being vandalized or looted.

Hazardous Material Site Stabilization Treatment Effectiveness Monitoring: Monitor effectiveness of treatment by detecting for any off-site migration of hazardous material.

Recommendations

This report is an initial funding request based on a rapid assessment. If additional treatment needs are identified through more site specific on the ground investigation in cooperation with interested agencies, noxious weed detection surveys, interim requests for additional funding will be filed. These funding requests will identify the purpose for each treatment, and specific treatment specifications, locations, and number of each treatment.

Part VI – Emergency Stabilization Treatments and Source of Funds

			NFS Lands				Other Lands			All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER \$	\$	units	\$	Units	\$	\$
A. Land Treatments										
Noxious Weed Surveys	Lump Sum									
Unauthorized Access Vegetative Screening	Lump Sum									
Condor Protection and Removal of Microtrash	Lump Sum									
<i>Insert new items above this line!</i>										
<i>Subtotal Land Treatments</i>										
B. Channel Treatments										
N/A										
<i>Insert new items above this line!</i>										
<i>Subtotal Channel Treat.</i>										
C. Road and Trails										
Road Patrol	Lump Sum									
Road Storm Response	Lump Sum									
Trail Storm Evaluation/Implementation	Lump Sum									
<i>Insert new items above this</i>										

<i>line!</i>	
<i>Subtotal Road & Trails</i>	
D. Protection/Safety	
BAER Implementation/Interagency Coordination	Lump Sum
Human Life and Resource Protection (Fire Area Closure)	Lump Sum
Hazardous Material Stabilization	Lump Sum
Structure Protection	Lump Sum
Abandoned Mine Closure	Lump Sum
Hazard Tree Mitigation	Lump Sum
Species Salvage	Lump Sum
Arroyo Toad Protection	Lump Sum
Cultural Resource Site Protection	Lump Sum
Protection Enforcement	Lump Sum
<i>Insert new items above this line!</i>	
<i>Subtotal Structures</i>	
E. BAER Evaluation	
Assessment Team	Lump Sum

Insert new items above this

<i>line!</i>	
<i>Subtotal Evaluation</i>	
F. Monitoring	
Treatment Effectiveness	Lump Sum
<i>Insert new items above this line!</i>	
<i>Subtotal Monitoring</i>	
G. Totals	
Previously approved	
Total for this request	

Appendix A
Station Fire Map Figures

- Map 1. Soil Burn Severity & Pour Points
- Map 2. Treatments
- Map 3. Untreatable Lands
- Map 4. Slope
- Map 5. Erosion Hazard Rating
- Map 6. Wildlife Resources
- Map 7. Sensitive Plants & Noxious Weeds



