BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

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

B. Type of Action

[X] 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: **Creek**

B. Fire Number: **CA-LAC-362189**

C. State: **California**

D. County: **Los Angeles**

E. Region: **05 – Pacific Southwest**

F. Forest: **01 - Angeles**

G. District: **Los Angeles Gateway**

H. Fire Incident Job Code: **P5LH7818**

I. Date Fire Started: **December 5, 2017**

J. Date Fire Contained: **Est. Dec. 23, 2017**

K. Suppression Cost: **$16,700,000** (estimate from 12/17/2017)

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): Dozer 19.2; Handline 3.7
2. Fireline seeded (miles): No fireline seeded
3. Other (identify):

M. Watershed Number:

Sub-Watershed Name	HUC12	Acres in Fire Perimeter	% High + Mod	% in Fire Perimeter
Little Tujunga Creek	180701050104	8,858	41%	57%
Lower Big Tujunga Creek	180701050105	4,547	16%	29%
Upper Pacoima Wash	180701050205	3	33%	<1%
Lower Pacoima Wash	180701050206	1,627	22%	10%
Tujunga Wash-Los Angeles River	180701050208	584	10%	4%

N. Total Acres Burned:
NFS (7,757) Other Federal-COE (92) City/County (945) Private (6,825)

O. Vegetation Types: The major plant communities affected by the fire include chamise chaparral, mixed chaparral, coast live oak/sycamore riparian forest, canyon/coast live oak woodland, cottonwood/sycamore riparian woodland, and riparian willow scrub.

Chamise and mixed chaparral are the dominant vegetation communities above 2,000 feet in the burn. Chamise chaparral occurs on south and west facing slopes and mixed chaparral predominately occupies northern slopes, drainages, and all slopes at elevations over 3,000 feet within the burn area. These vegetation types are dominated by chamise (Adenostoma fasciculatum), bigberry manzanita (Arctostaphylos glauca), hoaryleaf ceanothus (Ceanothus crassifolius), birchleaf mountain-mahogany (Cercocarpus betuloides), scrub oak (Quercus berberidifolia), chaparral ash (Fraxinus velutina), bush poppy (Dendromecon rigida), hairyleaf yerba santa (Eriodictyon crassifolius), and laurel sumac (Malosma laurina).

Coast live oak/sycamore riparian forests occur in pockets of drainages throughout the fire area, along Little Tujunga Creek, and other north-facing canyons throughout the burn area. The over story is dominated by coast live oak (Quercus agrifolia) and sycamore (Platanus racemosa) with the occasional red willow (Salix laevigata) and cottonwood (Populus fremontii). The understory consists of scattered weedy annual grasses such as ripgut brome and wild oats, heartleaf keckiella (Keckiella cordifolia), chaparral ash, rush (Juncus sp.) and hoaryleaf ceanothus.

Cottonwood/Sycamore Riparian Woodlands along Little Tujunga Creek, and in small pockets in drainages, consist of cottonwoods, western sycamores, and coast live oak. Weedy annuals and non-native brome grasses and wild oats found in the understory of open canopies.

Riparian Willow Scrub is found along portions of Little Tujunga Canyon and various other intermittent drainages throughout the burn area. These areas are dominated by willow, cottonwood, and western sycamore. Black elderberry, mule fat, and smaller shrubs exist in the understory.

P. Dominant Soils (Families):
- Trigo: 7,788 Acres (50%)
- Modesto: 2,012 Acres (13%)
- Soboba: 1,370 Acres (9%)
- Saugus: 990 Acres (6%)
- Chilao: 830 Acres (5%)

Q. Geologic Types: The Creek fire is located in the Transverse Provence. The San Gabriel Mountains consist of Precambrian to Cretaceous age gneisses and granite's, which produce toppling rock fall failures. The basement rocks are uncomfortably overlain by early Pleistocene Saugus Formation consisting of loosely consolidated sands, gravels, and conglomerates. This formation is highly erodible. Orographic uplift produces may produce torrential rains. Flooding, hyper-flooding, debris flows, debris torrents may occur.

R. Miles of Stream Channels by Order or Class:
Perennial: 4.8 Intermittent: 10 Ephemeral: 86.6

S. Transportation System (miles)

Roads: 2.4 miles Maintenance Level 5
0.3 miles Maintenance Level 4
1.7 miles Maintenance Level 3
29.2 miles Maintenance Level 2
Trails: 8.6 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 9,178-low 4,604-moderate 179-high 1,658-unburned

B. Water-Repellent Soil (acres): 974

C. Soil Erosion Hazard Rating (acres):
- None: 786 Acres (5%)
- Low: 1,556 Acres (10%)
- Moderate: 952 Acres (6%)
- High: 2,049 Acres (13%)
- Very High: 10,276 Acres (66%)

D. Erosion Potential: 5.53 tons/acre

E. Sediment Potential: 5,169 cubic yards/square mile

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): 1 hour

E. Design Storm Magnitude (inches): 0.8

F. Design Flow (cubic feet / second / square mile): 14.5

G. Estimated Reduction in Infiltration (percent): 6

H. Adjusted Design Flow (cfs per square mile): 56.8

PART V - SUMMARY OF ANALYSIS

Background: The Creek Fire started on December 5, 2017; burned about 15,619 acres was 98% contained on December 15, 2017. Driven by strong Santa Ana winds and low relative humidity, the fire spread quickly, burning across FS lands. The fire burned dominantly in the Little Tujunga watershed of the Los Angeles River Basin. The burned area is within the Los Angeles Gateway District on the Angeles National Forest.

In the Creek Fire, the chaparral that burned included chamise (Adenostoma fasciculatum), laurel sumac (Malosma laurina) and scrub oak (Quercus berberidifolia). These species sprout vigorously after fire. Other common elements included buckwheat (Eriogonum fasciculatum), white sage (Salvia apiana), and Eastwood manzanita (Arctostaphylos glandulosa). All of these species regenerate from seed after fire, and fire enhances seed germination. In the first spring after a fire there is abundant growth of deciduous, semi-woody and herbaceous plants that arises from the seed bank or from underground rhizomes or bulbs. In studies from fires nearby in Southern California; they indicate that first year post-fire herbaceous cover has an average herbaceous cover measured between 30 and 80 percent. Common native species included annual snapdragon (Antirrhinum coulterianum), pincushion flower (Chaenactis artemisiaefolia), popcorn flower (Cryptantha intermedia), and annual lotus (Lotus salsuginosus).

A. Describe Critical Values/Resources and Threats (narrative):
("Critical Values" from ID 2520-2017-1, effective April 6, 2017)

A list of values important to the Angeles National Forest was provided through a BAER team meeting beginning on December 11th. The BAER team subsequently evaluated this list of values through field assessment and associated analysis to determine the critical values (FSM 2523.1 – Exhibit 01) that may be treated within the BAER program. The risk (FSM 2523.1 – Exhibit 02) to these critical values has been assessed by the BAER team and is described below. The characterization of the threat to these critical values is based on a very similar sequence of events within and adjacent to watersheds following previous fires. A list of treatment numbers has been included below each critical value description to ensure tracking between values and treatments.

1. Human Life and Safety (HLS)
    a. Very high risk to **forest visitors and Forest Service employees** within the Los Angeles Gateway District from the threat of flooding and debris flows to roads and trails making them impassable and/or unsafe from rock fall, debris, and falling trees. *(Treatment: T1)*
    b. Very high risk to **Forest Service employees** in the Los Angeles Gateway District for loss of ingress and egress and personal safety on the low water crossing between the district office and the fire facilities. Marek Canyon above this facility burned at moderate severity and has an elevated threat of sediment, rocks, and other debris. *(Treatment: T2)*
    c. Very high risk to **forest visitors and Forest Service employees** near four sites due to the threat of exposure to hazardous materials such as treated wood products, fire arms shooting debris, contents from burned storage facilities and illegal marijuana operations. *(Treatment: T5)*
    d. Very high risk to **forest visitors** in Limerock Canyon limekiln historic structures due to the increased threat personal falling injury/death into a exposed kiln chimneys on the soil surface. *(Treatment: T4)*
    e. Very High risk to **forest visitors** of the Oak Springs Trailhead and Day Use Area due to the increased threat of injury or death from falling trees along designated picnic spots and equestrian handling facilities. *(Treatment: T3)*
    f. Intermediate risk to **forest visitors** due to the threat of slips, falls, caving-in and exposure of previously hidden abandoned and inactive mine openings within the fire area of the public who may intentionally or inadvertently enter the mine areas. One mine adit in Limerock Canyon (horizontal underground opening) was identified during the field assessment and it was determined that it has naturally collapsed and

lessened the threat to human life and safety. Other mine adits were not assessed and still are a risk to human life and safety.

2. Property (P):
   a. Very high risk to **road infrastructure** due to an increased threat of damage expected to this Forest investment because flooding, debris flows, and erosion is imminent. *(Treatment: T6)*
   b. High risk to **trail infrastructure** due to an increased threat of damage expected to this Forest investment because flooding, debris flows, and erosion is imminent. The burned area contains about 8.6 miles of trails at risk. *(Treatment: T7)*
   c. Low risk to the **wildlife guzzlers** due to an increased threat of damage from burned trees near the remaining, unburned facilities. *(Treatment: T13)*

3. Natural Resources (NR):
   a. Immediate to High risk to **soil productivity and hydrologic function** as nearly 70 percent of the area within the fire perimeter burned with low soil burn intensity (as mapped with BARC). Post-fire field surveys indicate that over 95 percent of vegetation cover was consumed during the fire regardless of burn intensity. There is elevated potential of increased mass-wasting, slope failure and surface erosion. Localized erosion rates could more than triple with average rainfall events. All soils have varying degrees of surface water-repellency (hydrophobicity) regardless of burn severity. The hydrophobicity is naturally occurring and is exacerbated with fire. Hydrophobicity strongly impairs the ability of soil to infiltrate water thereby increasing runoff potential and erosive energy. Except for mechanically disturbed areas, a biological surface crust caps the soils and mitigates the effects of wind erosion from major Santa Ana wind events, which without the crust, could possibly be a greater threat to soil productivity than water erosion.
   b. Very high risk to **critical endangered habitat for Nevin's barberry**. An emergency situation for the continued existence of Nevin's barberry exists on Forest lands. This population of Nevin's barberry is the only known, naturally occurring population found on the Angeles NF. The population was burned at a moderate burn intensity. While it has been known to re-sprout following wildfire, there is a possibility that the Nevin's barberry population could have been destroyed, or greatly impaired by the fire. In addition to the possible burn intensity related impacts, there are two threats to Nevin's Barberry due to the Creek Fire. The first is illegal OHV and the second is illegal dumping. This population was protected prior to the fire due to the thick chaparral vegetation. The fire burned all vegetation surrounding the plants and the vegetation blocking illegal access areas. As a result, the population is now vulnerable because it lacks all barriers that keep it protected. *(Treatment: T10)*
   c. High risk to **native plant diversity and rare plants** due to the threat from the spread of noxious weeds and invasive plant species. An emergency exists with respect to vegetative recovery as a result of the threat of post-fire weed introduction and spread. The unknowing introduction and dispersal of invasive weeds into areas disturbed by fire suppression and rehabilitation has the potential to establish large and persistent weed populations. In addition, it is highly likely that existent weed infestations will increase in the burn area, due to their accelerated growth and reproduction and a release from competition with natives. These weed populations could affect the structure and habitat function of native plant communities within the burn area. It is expected that most native vegetation would recover if weed invasions are minimized. There are numerous unauthorized horse trails and OHV roads within the burn perimeter. The Creek Fire removed the vegetative barriers that previously

limited the amount of cross country travel occurring in the area. Continued or increased use of this area by horseback riders and illegal vehicles may facilitate the spread of invasive weeds. Additionally, the erosion and soil compaction caused by these types of uses may also inhibit the recovery of native plant populations. As a result, horseback and illegal vehicle use may contribute to increased density and distribution of invasive weeds. An increase in invasive weeds can contribute to type conversion and overall reduction in the density and distribution of native plants. *(Treatments: T9 and T10)*

d. Very high risk to critical habitat that is currently occupied by **California Condor** as a result of post-fire effects of the Creek Fire. The emergency condition results from the potential of increased accessibility to concentrated areas of lead and microtrash. The fire has removed vegetation and exposed areas where microtrash and ammunition related debris is now easily accessible by foraging condors. The concern is that condors may locate these sites and consume the microtrash present. The treatment objective is to reduce the potential for condors to consume microtrash and ammunition related debris. The primary treatment for removal of microtrash and ammunition hazards is manual clean-up of the site. *(Treatment: T8)*
e. Low risk to critical habitat that in currently occupied by **Southwestern Willow Flycatcher and Santa Ana Sucker** due to the minimal effects that the Creek Fire had on the Big Tujunga riparian areas.

4. Cultural and Heritage Resources (CHR):
   a. High to very high risk to **eligible cultural and historic sites** were affected by the fire. The sites sustained a complete loss of vegetation cover making them susceptible to minor slope wash, however only one site (Limekiln) is found to be at risk from accelerated rate extensive enough that it could be destructive to the cultural deposit. This site will be treated with a straw wattles to deflect overland flow. The remaining sites will be treated with a "no-action" treatment due to either low probability of effects from the deteriorated watershed, or to likely ineffectiveness of any available treatments. This will allow natural re-growth of vegetation to retain the stability of the deposits. *(Treatments: T4)*

B. Emergency Treatment Objectives:
The goal of the burned area emergency rehabilitation is to:

• Provide for Public Safety– Ensure communication of potential post fire values at risk has occurred. Reduce threat to life and safety by closing hazardous areas and roads until watershed stabilization has occurred and/or the threats/hazards have been removed. Re-evaluate the burned area before lifting the closures. Cleanup or stabilize hazardous material sites to prevent water and soil contamination.

• Limit Damage to Property- The District Office facility, private residences/businesses, other structures, water systems, and county roads and private driveways within and downstream of the burn area are at greater risk from flash flooding and sedimentation after the fire. Clearing channel obstructions and increasing the road cross-drainage capacity will help mitigate the effects of accellerated storm flows and sedimentation to property. The treatment objectives are to increase the awarness of the property owners, Natural Resource Conservation Service (NRCS), Los Angeles County Flood and Fire, and other agencies of the potentially hazardous conditions resulting from the Creek fire.

• Noxious Weeds - Reduce the potential for impaired vegetative recovery and introduction/spread of noxious weeds.

• Road and Trail Treatments – Objective is to improve road drainage to protect the road system. Reduce erosion fro the road surface and sediment delivery to stream channels. Reduce the threat to life and safety for road users.

• Limit loss of soil productivity – Post fire erosion rates have increased due to the burn itself, and to accelerated rates of runoff water impacting OHV trails causing additional erosion and sedimentation. Existing OHV trails should be waterbarred and reshaped to conform with the natural drainage charastics to reduce erosion thereby limiting loss of soil productivity.

• Cultural Resource Sites – Objectives are to increase soil stability and reduce the potential for erosion to protect cultural sites. Use fencing to reduce or prevent access to cultural resource sites.

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

Land -- % Channel -- % Roads/Trails 70 % Protection/Safety 80 %

D. Probability of Treatment Success

Treatment	Years after Treatment		
	1	3	5
Land	NA	NA	NA
Channel	NA	NA	NA
Roads/Trails	70	80	90
Road treatments are designed for increased runoff which will decrease as vegetation recovers.			
Protection/Safety	80	80	80

E. Cost of No-Action (Including Loss):

Value At Risk	Estimated Cost
Damage to Water Quality/Sedimentation Deposits	$500,000
Loss of Long-term Soil Productivity and Ecosystem Integrity from an increase in invasive species and erosion.	$1,200,000
Loss of Forest Service Facilities	$700,000
Loss of Recreational Opportunities	$550,000
Loss of Forest Roads	$1,100,000
Loss of Trail System	$390,000
Unauthorized damage to watershed (rutting and vegetative trampling)	$240,000
Total	**$4,680,000**

F. Cost of Selected Alternative (Including Loss):

Value At Risk	Estimated Cost
Damage to Water Quality, Loss of Forest Service Facilities, Loss of Recreational Opportunities. • This treatment is estimated to be 70% effective in reducing the frequency of runoff and slowing erosional processes. • 30% failure rate of $2,950,000 plus $76,583 of the cost of the protection treatments.	$3,911,583
Loss of Long-term Soil Productivity and Ecosystem Integrity from an	$1,595,665

increase in invasive species and erosion. • This treatment is estimated to be 70% effective in reducing the frequency of invasive plants and slowing erosional processes. • 30% failure rate of $1,200,000 plus $35,665 of the cost of the early detection and rapid response treatments.	
Loss of Forest Roads • This treatment is estimated to be 70% effective in protecting the forest roads. • 30% failure rate of $1,100,000 plus $234,942 of the cost of the road treatments.	$1,664,942
Loss of Trail System • This treatment is estimated to be 70% effective in protecting the forest trails. • 30% failure rate of $390,000 plus $30,040 of the cost of the trail treatments.	$537,040
Unauthorized damage to watershed (rutting and vegetative trampling) • This treatment is estimated to be 70% effective in protecting against resource damage. • 30% failure rate of $180,000 plus $59,139 of the cost of the unauthorized route stabilization treatments.	$293,139
Total	**$8,002,369**

G. Skills Represented on Burned-Area Survey Team:

[✓] Hydrology	[✓] Soils	[✓] Geology	[ ] Range	[✓] HAZMAT/Mineral
[ ] Forestry	[✓] Wildlife	[ ] Fire Mgmt.	[✓] Engineering	[ ]
[ ] Contracting	[ ] Ecology	[✓] Botany	[✓] Archaeology	[ ]
[✓] Fisheries	[ ] Research	[✓] GIS	[ ] Landscape Arch	

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Team Members:

Andrea Nick - GIS	Justin Seastrand – Recreation/Special Uses
Casey Shannon - Hydrology	David Peebles – Cultural Resources
Janet Nickerman - Botany	Cliff Johnson - Engineering
Leslie Welch - Wildlife	Joanna Huckabee – Cultural Resources
Nathan Sill - Fisheries	Kellen Takenaka - Soils
Kelsha Anderson – Hydrology	Mark Madsen – Botany
Andy Ramsey - Engineering	Joseph Gonzales – Hazardous Materials

H. Treatment Narrative:

These treatments were developed by each of the respective resource groups as part of a specification sheet that helped guide narrative and cost considerations. Each treatment proposal was then captured within this document. Since the development of those specification sheets, the team leader has communicated with BAER Coordinators at forest, regional, or national levels to ensure consistency with BAER authority.

Treatments:

T1 – Warning Signs

General Description of Treatment: Burned area signs warn the public identifying of the possible dangers associated with a burned area on major entry points into the burned area, trails and developed/dispersed recreation sites. It shall contain language specifying items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, and flash floods.

Suitable Sites: Five signs will be placed on major entry points and twenty five warning signs or safety placards at developed and dispersed recreation sites, smaller routes/roads, and/or trails.

Design/Construction Specifications: Directional signs shall match what was on the sign prior to the fire and shall be installed per Forest Service standards. These signs are to be placed on any roads and trails that are to remain open to use within the fire perimeter. Burned area warning signs along the roads shall consist of 0.08" aluminum, sheeted in high intensity Orange with black letters. The WARNING lettering shall distinct, with a suggested minimum of 5 inches in height and all remaining lettering shall be a minimum of 3.5 inches in height.

Purpose of Treatment: The purpose of the burned warning signs is to provide safety to the motorists, trail users and campers of upcoming dangers and/or objects. The risk to human and life and safety is increased by post fire effects such as falling trees, rolling rocks, and flash floods. The need to warn the public of these hazards with which they be totally unfamiliar is a direct result of the fire.

Describe Treatment Effectiveness Monitoring: District personnel will monitor or check signs after events to ensure that they will be effective for the future.

T2 – Los Angeles Gateway District Office Facilities Ingress/Egress

General Description of Treatment: This proposed treatment is to facilitate access to the fire facilities at the Los Angeles-Gateway (a.k.a. LARRD) District Office. A low water crossing occurs between the District Office and the fire facilities to the west. These fire facilities include a Hot Shot compound, helipad, and equipment yard. This low water crossing is constructed of concrete and is expected to be inundated with debris following high flow events. High rainfall events along with un-cleared debris would make for hazardous conditions to Forest personnel when crossing this low water crossing. Furthermore, lack of egress causes a potential hazard to Forest personnel living and working at the fire facilities west of the District Office. Egress is imperative for this personnel in the case of an emergency.

Suitable Sites: The proposed treatment is located at the Los Angeles-Gateway District Office compound.

Design/Construction Specifications: Equipment call up during and after storm events. Bring a backhoe/front end loader in to remove debris that is expected to be deposited on the low water crossing during and after high-intensity rainfall events.

Purpose of Treatment: The purpose of this treatment is to reduce / mitigate the risk to human life and safety to ensure ingress/egress to Forest Service personnel utilizing the fire facilities at the District Office. This will mitigate the safety risk to personnel when crossing the channel and provide use of the facilities on the west side of the channel following high flow events.

Describe Treatment Effectiveness Monitoring: District staff will monitor immediate safety concerns and the effectiveness of ingress/egress monitoring.

T3 – Hazard Tree Removal

General Description of Treatment: The fire impacted the developed Oak Spring trailhead and day use site. The treatment would provide immediate hazard mitigation for Forest users and Forest personnel that occupy this trailhead and day use picnic area. Hazard trees within and directly adjacent to the Oak Spring developed site will be removed.

Suitable Sites: Oak Spring trailhead and day use site.

Design/Construction Specifications: Fall and/or remove all hazard trees which have the potential of striking any recreation improvement or cause injury to public or Forest personnel at the developed site area.

Purpose of Treatment: To prevent further damage to recreation infrastructure; and to allow the use to continue with reduced risk of injury or property damage. The Creek Fire burned through the Oak Spring trailhead, creating hazardous conditions for visitors and workers and damaging or destroying infrastructure in this area. The BAER Team considered this treatment to be the minimum necessary to achieve a reduction in risk to human life, public safety and infrastructure protection. The Creek fire burned through this trailhead but left some of the infrastructure intact. The fire also created hazard trees which put the public and workers and infrastructure at substantial risk in locations where humans and infrastructure at the Oak Spring trailhead. Hazard trees create safety concerns. This treatment would provide immediate hazard mitigation by identifying and removing hazard trees. Human life/public safety and the infrastructure investment will be protected.

Describe Treatment Effectiveness Monitoring: Inspect prior to opening the recreation areas and monthly during the use season for the first year after implementation to ensure risk to infrastructure and public safety has been resolved.

T4 - Heritage Resource Protection and Safety Fencing - Limekilns

General Description: The resources are three German Limekilns built in the 1870's into the bottom of a slope immediately adjacent to a heavily traveled road that is open to the public. The limekilns are located side by side, with a cut or shelf above the kilns so the limestone could be dumped into their top openings. The material would then be heated and the powdered lime shoveled out through the brick lined arch at the front bottom of the kilns. The center limekiln, approximately 20 feet deep and 9 feet in diameter, is still partially visible and its top opening now easily accessible, while much of the kilns on either side have been more heavily obscured by sedimentation. However, their structure is thought to be intact under the soil. All vegetation that previously stabilized the slope and camouflaged the limekilns, and made accessing the top opening to the center limekiln almost impossible, has burned.

Location (Suitable Sites): The Limekilns are built into a slope along the west side of Little Tujunga Canyon Road, immediately adjacent to a turnout.

Design/Construction Specifications: Clear the existing 'shelf' located above the limekilns of debris with hand tools so that future debris eroding from the denuded slope above will have space to accumulate. Also use some of the existing sediments on the shelf to fill burlap sandbags to create a 'V' shape deflection structure above the limekilns. Use wire fencing and T

posts to create a safety fence around the top openings of the kilns in order to block access now that the vegetation once blocking access has burnt. The fencing construction should be as minimal possible while still blocking access so as not to draw more attention to the resource.

Purpose of Treatment: The purpose of this resource treatment is to reduce the safety risk of falling into a kiln, erosion, runoff, and flash flooding on a significant cultural resource in the Creek Fire that can damage or destroy its integrity.

Describe Treatment Effectiveness Monitoring: The effectiveness monitoring will detect changes to the site in terms of feature composition/integrity due to runoff, erosion and flash flooding that could affect site integrity and to monitor the condition and effectiveness of the safety fencing. The results of the effectiveness monitoring will be used to determine if additional management action or upkeep of the treatments are required to protect this site.

T5 – Hazardous Materials

General Description of Treatment: This treatment is for the stabilization of hazardous materials that were burned over and exposed during the Creek Fire Incident. This mitigation may include soil stabilization (i.e. wattles), removal, disposal, cleanup, burial, and/or signage that would reduce the threat of exposure to Forest users and personnel if there is a high risk potential. Ensuring hazardous materials do not enter water sources.

Suitable Sites: There are two hazardous waste sites that will be treated within the Creek Fire on NFS lands. A shooting range encroachment area upstream of the Los Angeles Gateway District Office and a treated wood equestrian ramp that burned up at the Oak Spring Recreation trailhead; a more descriptive list can be found in the Hazardous Materials Specialist report. The Forest Service has determined that these hazardous materials may cause detrimental harm to Forest users and personnel if left unmitigated and are a threat to water quality.

Design/Construction Specifications: Interagency coordination to see that the hazardous materials are cleaned up, mitigated, removed and/or disposed of by appropriate local jurisdictional authorities.

Purpose of Treatment: The Creek Fire caused sulfur fumes to be produced from one of the trash sites burning during the Creek Fire, exposing personnel in the area. Other burned trash and exposed landscape resulting after the Creek Incident burn will begin to move these hazardous materials via surface runoff and debris flows. Spreading these hazardous materials into lower drainages will spread the contamination onto a larger area.

Describe Treatment Effectiveness Monitoring: Forest personnel will direct and monitor stabilization of hazardous materials from NFS lands and coordinate with proper agencies to properly disposed of or mitigated appropriately.

T6 - Road Drainage

General Description: This treatment proposes that 11 roads (16 segments) covering 17 miles will be protected and preserved for continued Forest access and use. This roads treatment provides for protection of NFS road infrastructure from further damage. These treatments are designed to repair and supplement existing erosion control structures on Forest Service Roads to facilitate proper water drainage off the road, preserve the road tread, and decrease watershed efficiency.

Suitable Sites: A total of 11 roads are proposed for treatment. These include North Dody (2N94), Gold Creek (3N29), Yerba Buena (3N30), Kagel Truck Trail (3N32), Kagel Ridge (3N33), Oliver - BPL No. 1 (3N36), Doane-Ebey (3N38), Upper Marek Truck Trail (3N40), Lower Marek Canyon (3N42), Doane Canyon (3N43), and Indian Canyon (3N45). The burned over watersheds are at risk to accelerated storm flow events. Woody debris, large rocks or other material, may clog and plug drainages and bridges on roads resulting in storm water flooding a road or washing out culverts, bridges, and other structures downstream.

Design/Construction Specifications: This treatment will include a "system" of design/construction methods depending on the prisms current condition. The details of this treatment are provided in the engineering report and associated specifications and will be completed per Forest Service standards. Road treatment activities include:

- Install/Clean/Remove/Repair Inlets
- Re-shape/remove/construct dips
- Reset overside drains
- LO ditch construction
- Clean/reset flumes
- Change cross-slope/remove slough
- Place backfill
- Install/repair gabions
- Clean CMP flow
- remove hazard trees
- rock disadaptor/armor channel
- install/repair concrete inlet face
- install/repair concrete headwalls/timber walls/gates
- install/repair CMP snorkels

Describe Purpose of Treatment: The purpose of this treatment is to mitigate additional risk to Human Life and Safety, property, emergency ingress/egress, loss of access to visitors and local residents, and impacts to water quality and riparian areas. The BAER Team considered this treatment to be the minimum necessary to achieve a reduction in risk to the accumulated critical values of:

1. Soil productivity (within drainage bottoms)
2. Hydrologic function,
3. Water quality,
4. Road infrastructure,
5. Traveler safety along routes.

Describe Treatment Effectiveness Monitoring: Monitor the storm-patrol response time to ensure objectives are being met. Identify the type of storm event that mobilizes material.

T7 - Trail Drainage Improvement

General Description: Treatment would provide immediate protection to the trail system. Trails may capture increased surface runoff caused by the presence of water repellent soils and lack of effective ground cover to inhibit excessive flow. Flows will intercept system trails and cause severe tread erosion and initiation of soil rutting adjacent to the trails. The trail system would be improved to withstand increased runoff, protecting property, workers and users.

Suitable Sites: Trails located within the Creek Fire perimeter of National Forest System Trail (NFST) were impacted by the fire. 8.6 miles of non-motorized trail burned within the fire

perimeter. These non-motorized trail are within or directly below the moderate to high burn severity sections of the Creek fire. The managed use for these trail systems is strictly non-motorized. Priority trails to be worked on include those that are within or below moderate to high soil burn severity slopes and those with sustained steep grades that have inadequate drainage. This would include all 8.6 miles of trail within the burn perimeter.

Design/Construction Specifications: Install water-bars depending on steepness of trail (18 per mile) in areas of moderate or high severity. Install water bars in sections of trail that have continuous gradient for a length of greater than 50 feet and are either in sloped (cupped) or show evidence of routing water (rills, gullies). Construct tread retention structures where necessary and downslope, stabilizing vegetation has been consumed. Hazards within the trail route that restrict access to work sites will be removed (rocks, trees) Clean existing water bars. Removal of identified hazards surrounding work site locations. If the area has to large a safety risk then the work will be delayed until safety risk is stabilized

Purpose of Treatment: Trails within the Creek fire are located within and downslope of moderate to high soil burn severity slopes. Predicted increased runoff due to water repellant soils and lack of effective ground cover will be intercepted and captured by trails, leading to severe trail tread erosion that will render the trails unusable or dangerous to use. Additional hazards caused by the fire such as hazard trees and rock fall will create unsafe conditions at trail access points and worksites along the trails to workers. Accelerated erosion that is channelized downslope and into streams may cause damage water quality.

Describe Treatment Effectiveness Monitoring: The drainage improvements will be inspected throughout the year and in the spring of 2018 to monitor the effectiveness of water run-off and the trail drainage condition.

T8 – Micro-Trash Cleanup Condor Habitat

General Description: 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.

Suitable Sites: The sites included for treatment are next to the Little Tujunga Canyon Road.

Design/Construction Specifications: Microtrash removal is conducted manually. Crews pick up all visible trash and place in bags for disposal in an appropriate garbage receptacle.

Purpose of Treatment Specifications: Removal of microtrash benefits the federally endangered California condor. The fire has increased visibility and availability of garbage and microtrash. This leads to an increased potential for this debris to be consumed by California condors foraging in the area. Microtrash consumption can lead to condor injury or death of adult condors and chicks. Sites with a concentration of microtrash pose a risk for condors. The fire has removed vegetation and exposed areas with concentrations of microtrash that is now easily accessible to foraging condors.

Treatment Effectiveness Monitoring Proposed: Visual surveys of the treatment area can be used to assess if microtrash is present.

T9 - Early Detection/Rapid Response Invasive Weed Monitoring

General Description: Use personnel to monitor the Creek fire area on NFS lands for new invasive weed sites. Upon location, document the site, treat it and return with in two weeks and determine the effectiveness of the treatment and retreat if required.

Suitable Sites: Creek Fire burned area with special focus areas adjacent to known point locations of Arundo (Arundo donax), Wild oats (Avena spp.), ripgut brome (Bromus diandrus), cheatgrass (Bromus tectorum), tocalote (Centaurea melitensis), shortpod mustard (Hirschfeldia incana), tree tobacco (Nicotania glauca), yellow star thistle (Centaurea solstitialis), tree of heaven (Ailanthus altissima), giant reed (Arundo donax), pampas grass (Cortaderia selloana), fountain grass (Pennisetum spp.), castor bean (Ricinus communis), Russian thistle (Salsola spp.), Peruvian pepper tree (Schinus molle), saltcedar (Tamarix ramosissima), and Spanish broom (Spartium junceum). Also, focused attention will be given to disturbance corridors such as bulldozer lines, drop points, and fire travel corridors.

Design/Construction Specifications: Early Detection/Rapid Response Monitoring System will provide early detection of new infestations. Regular monitoring of the Creek Fire burned area on NFS lands will take place. When new invasive species infestations are detected, a prompt and coordinated containment and eradication response will occur to eliminate the proliferation of these invasive weeds on NFS lands. Upon location, document the site, treat it and return within three weeks and determine the effectiveness of the treatment. Repeat the treatment and effectiveness monitoring until new invasive weed sites are eradicated.

Describe Purpose of Treatment: Arundo (Arundo donax), Wild oats (Avena spp.), ripgut brome (Bromus diandrus), cheatgrass (Bromus tectorum), tocalote (Centaurea melitensis), shortpod mustard (Hirschfeldia incana), tree tobacco (Nicotania glauca), yellow star thistle (Centaurea solstitialis), tree of heaven (Ailanthus altissima), giant reed (Arundo donax), pampas grass (Cortaderia selloana), fountain grass (Pennisetum spp.), castor bean (Ricinus communis), Russian thistle (Salsola spp.), Peruvian pepper tree (Schinus molle), saltcedar (Tamarix ramosissima), and Spanish broom (Spartium junceum) are known to occur adjacent to the burn area. The purpose of this treatment is to prevent the spread of the invasive weeds into the Creek fire area on NFS lands. Keeping the proliferation of invasive weeds to a minimum within the Creek fire burned area is high priority.

Describe Treatment Effectiveness Monitoring: Early Detection/Rapid Response monitoring system will be set up within the Creek Fire area on NFS lands.

T10 – Unauthorized Route Stabilization

General Description: There are numerous unauthorized horse trails and OHV roads within the burn perimeter. Furthermore, dozer lines created during the Creek Fire suppression have created new unauthorized travel corridors on the northern and eastern flanks of the burned area. The Creek Fire and dozer line suppression activities removed the vegetative barriers that previously limited the amount of cross country travel occurring in the area. Continued or increased use of this area by horseback riders and illegal vehicles may facilitate the spread of invasive weeds. Additionally, the erosion and soil compaction caused by these types of uses may also inhibit the recovery of native plant populations. As a result, horseback and illegal vehicle use may contribute to increased density and distribution of invasive weeds. An increase in invasive weeds can contribute to type conversion and overall reduction in the density and distribution of native plants.

Suitable Sites: Disturbed sites from suppression and the area adjacent and within Nevin's barberry critical habitat.

Design/Construction Specifications: Access points to unauthorized roads, trails, and/or dozer lines will be gated or blocked by the Forest. The access points will need to be identified and evaluated for the method of closure needed. Monitoring is needed to insure that closures are enforced. This monitoring is provided for in another treatment specification (storm patrols).

Describe Purpose of Treatment: The purpose of this treatment is to prevent the proliferation of invasive weed throughout the Creek Fire burned area and to insure that the Nevin's barberry population and habitat within the burn perimeter is protected from invasive weed encroachment and soil productivity is protected. Furthermore, illegal and unauthorized routes contribute to erosional influences that contribute to a loss of soil within the Creek fire burned area. This loss of soil further contributes to mass wasting processes in the area and causes a general loss of productivity. This treatment serves to preserve natural vegetative recovery by helping to prevent post-fire weed introduction and spread and prevent further loss of soil. The unknowing introduction and dispersal of invasive weeds into areas disturbed by fire suppression and rehabilitation has the potential to establish large and persistent weed populations. In addition, it is highly likely that existent weed infestations will increase in the burn area, due to their accelerated growth and reproduction and a release from competition with natives. These weed populations could affect the structure and habitat function of native plant communities within the burn area. It is expected that most native vegetation would recover if weed invasions are minimized. Natural vegetative recovery and prevention of unauthorized route use would promote Nevin's barberry recovery and habitat retention. The fire burned the vegetation blocking illegal access areas. As a result, the population is more vulnerable because it lacks all barriers that helped to keep it protected.

Describe Treatment Effectiveness Monitoring: Effectiveness will be measured by site visits and the lack of evidence of unauthorized trail use within the Creek fire burn perimeter.

T11 - Interagency Coordination/Team Lead Implementation

General Description: There is a need to continue the interagency coordination initiated during the BAER assessment. This involves communication and coordination with other federal, state and local agencies with jurisdiction over lands where life and property and water quality are at risk from post-fire conditions. Actions include but are not limited to cooperating with other agencies on hazard notification systems, exchanging information and coordinating the BAER implementation plan as needed when subsequent recovery plans are developed by other agencies. Threats to life, property and water quality requires coordination with many agencies. The Forest Service plans on continuing to collaborate and communicate with partnering agencies, other entities and organizations and the public.

Suitable Sites: The communities of Lakeview Terrace, San Fernando, Sylmar, and Sunland are at risk and coordination with other federal, state and local agencies will be for the benefit of these communities as well as other State and private lands found within the burn scar that are at risk from post-fire conditions.

Design/Construction Specifications: Coordination with other federal, state and local agencies with jurisdiction over lands where life and property and water quality are at risk from post-fire conditions. Implementation of BAER treatments will also require some time from an Interagency Coordinator to coordinate support from non-federal entities.

Purpose of Treatment: Continue the interagency coordination initiated during the BAER assessment. This involves communication and coordination with other federal, state and local

agencies with jurisdiction over lands where life and property and water quality are at risk from post-fire conditions.

Describe Treatment Effectiveness Monitoring: Not Applicable.

T12 – Storm Patrols

General Description: The patrols are used to identify those road problems such as plugged culverts and washed out roads and to clear, clean, and/or block those roads that have received damage. These patrols will also serve to protect homeless life and safety in riparian systems and drainages, monitor and enforce closures, monitor and inspect burned area warning signs, and protect wildfire-exposed cultural sites from looting activities. The storm patrollers shall have access to at least a backhoe and dump truck that can be used when a drainage culvert is plugged or soon to be plugged, and to repair roads which are exhibiting severe surface erosion.

Suitable Sites: The patrols should focus on those areas of the burn where use by the public is high. These include major travel corridors in the Creek burn perimeter such as the Little Tujunga Canyon, Lopez Canyon, and Gold Creek Roads.

Design/Construction Specifications: Immediately upon receiving heavy rain and during significant spring snowmelt the FS will send out patrols to identify road hazard conditions – obstructions such as rocks, sediment, washouts, and plugged culverts, so the problems can be corrected before they worsen or jeopardize forest road users. The patrols shall bring in heavy equipment necessary to mechanically remove any obstructions from the roads and culvert inlets and catch basins where necessary. All excess material and debris removed from the drainage system shall be placed outside of the bank-full stream channel where it cannot re-enter the stream. The patrols will monitor and notify law enforcement of road/route closure violations, inspect and monitor burned area sign condition, notify law enforcement of homeless use in drainages and review cultural sites for looting and disturbance within the burn perimeter exposed by the wildfire.

Purpose of Treatment: The purpose of this treatment is emergency ingress/egress, human life safety and cultural resource protection. Indirectly, debris that is not removed immediately could cause more substantial loss of infrastructure and associated sediment/debris that in turn causes an impact to Water Quality and Riparian areas. Exposed cultural sites will be protected from looting.

Roads within the Creek fire contain drainage structures that cross primarily intermittent streams located in watersheds that have a moderate and high burn severity. These streams now have the potential for increased runoff and debris flows. These increases in flows pose a threat to the existing crossings which may result in plugging culverts or exceeding their maximum flow capacity. If these flows plug drainage structures, the result will likely be additional erosion and debris further down the drainage due to the failures of the fill slopes of the roads.

There is an immediate and future threat to travelers along these roads and homeless living within the burn area due to the increased potential for rolling and falling rock from burned slopes and increased potential for falling trees, flash floods and mudflows. The post-fire flooding will threaten to interrupt access to visitors, local residents, and Forest Service personnel who are implementing treatments. With the loss of vegetation, normal storm frequencies and magnitudes can more easily initiate rill and gully erosion on the slopes and it is likely that this runoff will cover the roads or cause washouts. These events make for hazardous access along steep slopes and put the safety of Forest visitors and administrative personnel at risk.

The purpose of the monitoring is to evaluate the condition of roads, culverts, emergency signage, closure conditions for motorized access. Identify and implement additional work needed to maintain and/or repair damage to road surfaces, flow conveyance structures (culverts, bridges), signs, and closure barriers across roads in order to insure safe access across FS lands.

Describe Treatment Effectiveness Monitoring: Monitor the storm-patrol response time to ensure objectives are being met. Identify the type of storm event that mobilizes material.

T13 – Water Guzzler Protection

General Description: Six wildlife guzzlers were assessed within the burn perimeter. These guzzlers are designed to capture rainwater and store it in an enclosed tank. The stored water is then made available throughout the year to provide wildlife with a drinking source. These guzzlers were either damaged by the fire or have potential to be damaged by post-fire events.

Description of Suitable Sites: The guzzlers included for treatment are located in proximity of Gold Creek Road and Yerba Buena Road.

Design/Construction Specifications: Protection of guzzlers will be accomplished with the placement of waddles designed to protect them from impacts associated with land flows and debris flows. Waddle installation will require trenching and stakes. The clean-up of the burned guzzler can be accomplished with hand tools. This material will be placed in bags for disposal in an appropriate garbage receptacle. Labor will be contributed by local volunteer group.

Purpose of Treatment: Proposed treatments will protect guzzlers from land flow and debris flow damage. Clean-up of the burned guzzler will ensure the burned material is not mobilized by wind and rain. This will prevent the contamination of adjacent areas by the debris that was created when the guzzler burned. Post-fire debris flows could damage guzzlers and render them inoperable. Additionally, there is one guzzler which was completely burned during the fire and now presents a situation where the burned fiberglass and debris has potential to be transported to adjacent areas.

Describe Treatment Effectiveness Monitoring: Visual surveys of the guzzlers can be used to determine if protective devices are still functioning.

I. Monitoring Narrative:
(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Date of Report: December 18, 2017

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #__

			NFS Lands			Other Lands				All
Line Items	Units	Unit Cost	# of Units	BAER $	Other $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$0	$0		$0		$0	$0
B. Channel Treatments										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
T6-Road Drainage	miles	14	$17,025	$234,942	$0		$0		$0	$234,942
T7-Trail Drainage	site	8.6	$3,493	$30,040	$0		$0		$0	$30,040
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$264,982	$0		$0		$0	$264,982
D. Protection/Safety										
T1-Warning Signs	each	30	$351	$10,539	$0		$0		$0	$10,539
T11-Interagency Coord.	each	1	$7,250	$7,250			$0		$0	$7,250
T12-Storm Patrol	acres	7,000	$4	$28,540	$0		$0		$0	$28,540
T13-Water Guz. Protect	each	3	$808	$2,425			$0		$0	$2,425
T2-LARRD Office	each	1	$5,800	$5,800	$0		$0		$0	$5,800
T3-Hazard Trees	site	1	$2,703	$2,703	$0		$0		$0	$2,703
T4-Cultural Res Protection	each	1	$3,233	$3,233	$0		$0		$0	$3,233
T5-Hazardous Materials	each	2	$5,730	$11,460	$0	0	$0		$0	$11,460
T8-Condor Habiat	sites	2	$2,325	$4,650	$0		$0		$0	$4,650
T9-EDRR	each	1,770	$20	$35,648	$0		$0		$0	$35,648
T10-Unauthorized Routes	acre	7,000	$8	$59,139	$0		$0		$0	$59,139
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$171,387	$0		$0		$0	$171,387
E. BAER Evaluation										
Initial Assessment	Report	$82,000	1	---	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$436,369	$0		**$0**		**$0**	**$436,369**
Previously approved										

PART VII - APPROVALS

1. _____ 12/19/17
Forest Supervisor (signature) Date

2. _____ 12/20/17
Regional Forester (signature) Date