Date of Report: 08/28/18

BURNED-AREA REPORT

(Reference FSH 2509.13)

Introduction:

The US Forest Service Burned Area Emergency Response (BAER) team arrived on August 17, 2018 to evaluate the Holy Fire burn scar post-fire watershed response to rainfall. The BAER team determines the risks to life, property, and critical cultural and natural resources on Forest Service lands by identifying specific values at risk and the threats to them from erosion, sedimentation, rock fall, flooding, and debris flows. The California Watershed Emergency Response Team (WERT), who are working in collaboration with the BAER team, evaluates the values at risk outside the Forest boundary using watershed response information generated by the BAER team. All of this information is shared with cooperating agencies so that all affected land managers can determine what mitigation measures may be needed. The Cleveland National Forest can only treat the values at risk that are on USFS managed land. Owners and managers of values at risk outside the USFS boundary may desire to apply treatments on USFS lands to protect their values; they are responsible for planning, financing, and implementing those treatments if they have an agreement with the Cleveland National Forest.

This report is a synopsis of BAER findings and the Forest Service's internal request for implementation funding **on Forest Service lands only**. Specialist reports are available on the Cleveland National Forest website at: https://www.fs.usda.gov/main/cleveland/home

Forest Service lands that burned are very steep and remote with values at risk such as roads, trails, hazardous materials Work to mitigate these values at risk on Forest represents a small portion of the implementation work that will need to be done on the lands surrounding the National Forest. Mitigation work outside the Forest boundary is the responsibility of those land managers and is being coordinated by Orange and Riverside Emergency Management Departments (EMD) and their many cooperators who will use the information that the Forest Service has generated across the total burn area to focus their work.

The BAER team attended meetings at both the Orange County and Riverside EMD offices to share preliminary information with a large group of emergency management cooperators about the post-fire watershed condition, responsibilities, and future agency and public meetings. There are many other non-emergency agencies and cooperators who will have access to our reports and specialists. The rapid assessment nature of the BAER assignment precludes meeting with all interested parties.

Cooperators include (partial list):

USFS BAER team
California Watershed Emergency Response Team
Orange County EMD
Riverside County EMD
Natural Resource Conservation Service
NOAA Weather Service
Army Corps of Engineers
CalTrans

PART I - TYPE OF REQUEST

A. Type of Report

[X] 1. Funding request for estimated WFSU-SULT funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[X] 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation 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: Holy Fire

B. Fire Number: CA-CNF 002664

C. State: California

D. County: Riverside and Orange County

E. Region: 05

F. Forest: Cleveland NF, 02

G. District: Trabuco Ranger District

H. Date Fire Started: August 6, 2018

I. Date Fire Contained: Unknown as of 8/27/18

J. Suppression Cost:

K. Fire Suppression Damages Repaired with Suppression Funds
1. Completed Dozer Line: 98 miles
2. Completed Hand Line: 24 miles
3. Drop points/Helipads: 14 spots

L. Watershed Number:

HUC 6	Name
180702020308	Lake Elsinore
180702030602	Dawson Canyon-Temescal Wash
180702030604	Bedford Wash-Temescal Wash
180702030901	Upper Santiago Creek
180703010101	Upper San Juan Creek
180703010102	Middle San Juan Creek
180703010103	Arroyo Trabuco

M. Total Acres Burned: 22,870 Acres (BARC perimeter was edited to remove 112 acres of unburned at the edge of the burn area—BARC perimeter acreage is 22,982)
NFS Acres(**18,165**) Other Federal ( ) State ( ) Private (3,732) Local Gov (972)

N. Vegetation Types on National Forest System Lands: Mixed Chaparral, Chamise Chaparral, Manzanita

Chaparral, Big-cone Douglas Fir Forest, Knob-cone Pine Forest, Coulter Pine Forest, Mixed Conifer Forest, Coast/Canyon Live Oak Woodland, Scrub Oak Woodland, Cottonwood/Sycamore Riparian Woodland, Riparian Willow Scrub.

The dominant vegetation types in the burn area are chamise chaparral and mixed chaparral which will resprout in low to moderate burn areas. The ground survey showed particularly high burn severity in areas dominated by dense manzanita. Pine and mixed conifir forest types with non-serotinous pine species will require long-term recovery where stands occur in moderate to high burn severity areas.

			Soil Burn Severity							
	Grand Total		High		Moderate		Low		Unburned/Very Low	
Cover Type	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Annual Grasses and Forbs	9	0.05	0	0.00	6	0.04	2	0.01	0	0.00
Barren	38	0.21	0	0.00	24	0.13	8	0.04	6	0.03
Bigcone Douglas-Fir	2282	12.68	762	4.23	1423	7.91	72	0.40	26	0.14
Ceanothus Mixed Chaparral	83	0.46	0	0.00	80	0.45	2	0.01	1	0.00
Chamise	1193	6.63	20	0.11	1054	5.85	90	0.50	29	0.16
Coulter Pine	80	0.44	42	0.23	37	0.21	0	0.00		
Canyon/ Coast Live Oak	1929	10.71	599	3.33	1108	6.16	110	0.61	112	0.62
Montane Mixed Chaparral	10958	60.86	1591	8.8400	8486	47	524	2.91	357	1.98
Riparian Mixed Hardwood	135	0.75	43	0.24	82	0.45	7	0.04	3	0.02
Scrub (Oak, Sagebrush, Buckwheat)	1290	7.16	151	0.83	808	4.49	183	1.01	148	0.83
Urban	8	0.04	0	0	4	0.02	2	0.01	2	0.02
Total	18005	100.0	3209	17.82	13113	72.83	999	5.54	684	3.81

O. Dominant Soils:

The Cieneba soils are derived from granitic residuum with coarse soil texture that is prone to increased water repellency, droughty conditions, and dry ravel. Because of the increased water repellency, erosion rates can be quite high. The Friant and Tollhouse soils are derived from metasediment residuum. These soils are finer soil textured than Cieneba and have a higher rate of potential erosion. They tend to also be slightly higher in soil productivity.

Map Unit	Soil Type	% Coverage
142	Cieneba sandy loam, eroded	11.38%
145	Cieneba-Rock outcrop complex	22.69%
153	Friant fine sandy loam	35.33%
192	Rock outcrop-Cieneba complex	4.44%
212	Tollhouse-Rock outcrop complex	8.14%

P. Geologic Description:

Geology: The Holy Fire occurred on the Santa Ana Mountain block, bounded by the Elsinore fault zone to the east and the Christianitos fault zone to the west. The burn area is underlain predominantly by Jurassic-aged Bedford Canyon formation, a slightly metamorphosed assemblage of marine sediments, and Cretaceous-aged heterogeneous granitic formations, and overlain by Quaternary alluvial and surficial sediments to present age (Morton and Miller, 2006). Young landslide deposits, Holocene and late Pleistocene in age, are pervasive throughout the burn area due to steep topography and highly fractured rock. These deposits are composed of displaced bedrock blocks and/or poorly sorted rubble.

Geomorphology: The burned area is dominated by extremely rugged slopes, draining into Temescal Wash to the east, and flowing through Orange County to the Pacific Ocean to the west. The Santa Ana Mountains ridgeline has crest elevations of 1,200 to 1,700 m (3,940 to 5,580 ft). The east flank of the range is deeply dissected, with drainages extending four to six km (2.5 to 3.7 mi) into the mountains up to the ridgeline. Drainages on the western flank are also deeply dissected and extensively developed.

Q. Miles of Stream Channels by Order or Class:

Perennial: 15 miles Intermittent: 1 miles Ephemeral: 37 miles

R. Transportation System

Trails: 17.3 miles Roads: 26.2 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): (unburned in edited perimeter: 1,542)

1,780 (low) 16,258 (moderate) 3,290 (high)

B. Water-Repellent Soil (acres): 17,500 acres (76% of burn area)

C. ~~Soil Erosion Hazard Rating (acres):~~

___ (low) ___ (moderate) _____ (high)

D. Erosion Potential in tons/acre.

Watershed	2 year event		10 year event	
	Unburned	Burned	Unburned	Burned
Trabuco Canyon	0.04	1.84	2.64	8.02
Bell Canyon	0.04	0.92	3.38	6.08
Mayhew Canyon	0.01	3.26	1.82	10.89
Coldwater Canyon	0.03	4.45	2.33	16.60
Horsethief Canyon	0.02	3.25	2.25	13.47
Indian Canyon	0.01	3.40	1.53	11.06
Holy Jim Canyon	0.05	0.95	2.61	5.18
McVicker Canyon	0.02	3.82	3.31	14.28
Bishop Canyon	0.03	2.40	0.92	7.58
Leach Canyon	0.02	3.64	3.49	14.28
Rice Canyon	0.02	3.81	1.97	11.90
Dickey Canyon	0.02	3.53	2.89	13.34

E. Sediment Potential: Pre-fire 1,536 /post-fire 50,037 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 5-10

B. Design Chance of Success, (percent): 80

C. Equivalent Design Recurrence Interval, (years): 2

D. Design Storm Duration, (hours): 60

E. Design Storm Magnitude, (inches): 0.736-1.06

F. Design Flow, (cubic feet / second/ square mile): 13.36

G. Estimated Reduction in Infiltration, (percent): 60

H. Adjusted Design Flow, (cfs per square mile): 54.27

I. Summary of Watershed Response:

Hydrologic Response:

The Holy Fire took place in a region that receives moist winters and dry summers (Figure 1). Precipitation throughout the burn area ranges from about 13 to 23 inches per year, with 78% of the precipitation occurring from October through April often in several storms events. Stream channels in the burn area have the potential to flash flood, especially areas along Arroyo Trabuco, Coldwater, Mayhew, Indian, Horsethief, Rice, McVicker, Leach, or Dicky Canyons and their tributaries which are at notably increased risk for larger, flashier flooding due to the fire.

Watersheds along the western side of the 2018 Holy Fire drain southwest into Arroyo Trabuco and San Juan Creek which enter the Pacific Ocean near Dana Point. This portion of the Fire is covered by the San Diego

Region Basin Plan. The Northeastern portion of the fire drains into Temescal Wash which eventually drains into the Prado Flood Control Basin on the Santa Ana River. McVicker, Leach, and Dickey Canyons drain to Lake Elsinore which is the terminus of the San Jacinto River basin and has an overflow into Temescal Wash. The eastern side is covered by the Santa Ana Region Basin Plan.

Surface waters impacted by the fire include the channels listed above, Lake Elsinore & Lee Lake. The channels flow about 20 miles before entering the Pacific Ocean.

Primary water quality constituents or characteristics changed by increased sedimentation from the Holy Fire include color, sediment, settleable material, suspended material, and turbidity. Floods and debris flows can entrain large material, which can physically damage infrastructure associated with the beneficial utilization of water (e.g., water conveyance structures; hydropower structures; transportation networks). The loss of riparian shading and the sedimentation of channels by floods and debris flows may increase stream temperature. Fire-induced increases in mass wasting along with extensive tree mortality can result in increases in floating material – primarily in the form of large woody debris. Post-fire delivery of organic debris to stream channels can potentially decrease dissolved oxygen concentrations in streams. Fire-derived ash inputs can increase pH, alkalinity, conductivity, and nutrient flux (e.g. ammonium, nitrate, phosphate, and potassium), although these changes are generally short lived, nutrients are already impairing beneficial use in Trabuco and Lake Elsinore and low dissolved oxygen is already a problem in Lake Elsinore. Post-fire increases in runoff and sedimentation within the urban interface, and burned structures and equipment within the fire perimeter may also lead to increases in chemical constituents, oil/grease, and pesticides.

Large watersheds on the east side of the Holy Fire and Trabuco Canyon on the west are very steep near the upper ridges which increases the risk of watershed damage due to the fire. Large portions of these watersheds burned with moderate and high burn severity which result in a high potential for flooding and sediment.

Forest Service roads and trails in or below the burn are at increased risk. The Forest Road 6S13 into Trabuco canyon is located in the drainage bottom and is the sole access route to the Holy Jim and Trabuco Recreational Residence tracts and hiking trailheads up each canyon. The valley is narrow in some spots and the proximity of the road to the channel (crossing the channel multiple times) puts the road at risk for flooding and debris flow events. After the 2016 Holy Fire which burned only 146 acres above this road, 7 cars were trapped in the resulting mudflows. The 2018 Holy Fire burned 4,373 acres above this road and will likely cause much more damage.

The increase in peak flows is most applicable during the first year of recovery, then the hydrologic response will decrease in subsequent years. Predicted post-fire peak flows show an increase of about 2 to 7 times pre-fire values. The greatest increase in peak flow values occur in subwatersheds where burn severity is moderate to high and have highly erodible soils. Early precipitation events fill in available slope detention storage and create the rill and gully networks that are necessary to fully induce the expected increase in flood response from rainstorms. Available rock and sediment on now barren slopes are plentiful. Bulking from side slopes is anticipated to increase risk of large precipitation events. Latent sediment in channels of this fire is also plentiful. The results of a peak flow analysis show that pre-fire flows, weighted according to watershed area, were on average 13.36 cfs / sq.mi for a 2 year, 60 minute storm, while post-fire weighted flows were on average 54.27 cfs / sqmi for the same storm. Post-fire flows could lead to plugged culverts, flow over road surfaces, rill and gully erosion of cut and fill slopes, erosion and deposition along road surfaces and relief ditches, loss of long-term soil productivity, and threats to human safety. Some sedimentation of the ephemeral channels is likely to occur at an accelerated rate until vegetation establishes itself and provides ground cover.

Sediment is potentially increased after a fire due mostly to the loss of vegetation. After the first year of re-growth, post fire sediment also goes down dramatically but may be continue to be elevated above pre-burn levels for several years depending on available precipitation and flushing flows. High and moderate soil burn severity are analyzed as one unit because they both result in a high post fire increase in flow and sediment.

Erosion Potential:

The soils in the burn area are shallow and highly erosive. The productivity of the soil is naturally low but

downslope migration of soil during erosion is likely to reduce the thickness of soils, particularly at higher elevations and steeper slopes. Because the soils have low water-holding capacity, the removal of duff will likely reduce the natural recovery compared to more loamy soils. Reduction of soil productivity will last until shrub communities re-establish and subsequently increase duff and organic compounds within the soil. Also, the removal of duff and the high erosion rates in the area will increase the risk of flooding and debris flows due to the dramatic increase in surface flow and contribution to hydrologic bulking (increasing flow viscosity due to sediment input). Because the areas of highest erosion are too steep and rocky for effective land treatments, natural recovery will be relied upon for soil risk management.

Geologic Response:

Within the burned area of the Holy Fire, some drainages / areas show a great deal of past mass wasting as debris slide, debris flows and rockfall activity that will be increased during future storms. Other watersheds / areas have little evidence of recent past slope instability, but as conditions have changed due to the fire, erosion and new mass wasting might be initiated.

In watersheds that experienced moderate to high soil burn severity, as a result of the removal of vegetation by the fire, soils are exposed and have become weakened, and rocks on slopes have lost their supporting vegetation. Due to these post-fire new conditions, roads and trails are at risk from rolling rocks, plugged culverts, debris slides and in some cases, debris flows. Risks to human life, infrastructure, facilities, roads, trails, water bodies and natural resources is high in most areas in and downstream of the Holy Fire.

Debris Flow Potential: The US Geological Survey (USGS) - Landslide Hazards Program, has developed empirical models for forecasting the probability and the likely volume of post-fire debris flow events. To run their models, the USGS uses geospatial data related to basin morphometry, burn severity, soil properties, and rainfall characteristics to estimate the probability and volume of debris flows that may occur in response to a design storm (Staley, 2016). Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 12 – 40 millimeters per hour (mm/h) rate. We selected a design storm of a peak 15-minute rainfall intensity of 24 millimeters (0.94 inches) per hour rate to evaluate debris flow potential and volumes since this magnitude of storm seems likely to occur in any given year.

Based on USGS debris flow modeling it appears that under conditions of a peak 15-minute rainfall intensity storm of 24 millimeters per hour (0.94 inch/hr.), the probability of debris flows occurring is high (60-80% in some main channels and 80 -100% in other main channels) in a majority of the main channel/creeks in the burn area. Under these same conditions, predicted volumes of these debris flows are expected to range from 10K-100K cubic meters in these same channels. From the debris flow combined hazard map it appears that the majority of creeks in the burn area are predicted to produce debris flows of a high combined hazard.

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Values at Risk:

The table below is Exhibit 02 from FSM 2523.1. This matric was used to evaluate the risk level for each value identified during this BAER assessment. See FSM 2523.1 for additional information.

Risk Determination

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	**Very High**	**Very High**	**Low**
Likely	**Very High**	**High**	**Low**
Possible	**High**	**Intermediate**	**Low**
Unlikely	**Intermediate**	**Low**	**Very Low**

Table A (Appendix A) "Holy Fire Forest Service Critical Values At Risk" (VARs) has a list of critical VARs that were evaluated in this assessment. The table is a summary of the values (some of which were not identified as critical per Exhibit 01 from FSM 2523.1) within and along the Holy Fire area, as well as, the threats to those values, the probability of damage or loss, magnitude of consequences and the resulting level of risk. Red shaded cells are those values that rated out as "very high" or "high" risk. Yellow shaded cells rated out as "intermediate" risk and white cells rated out as "low" or "very low".

B. Emergency Treatment Objectives:

The primary objective of this Burned Area Emergency Response Report is to recommend prompt actions deemed reasonable and necessary to effectively protect, reduce or minimize significant threats to human life and property and prevent unacceptable degradation to natural and cultural resources. The application of these BAER treatments are expected to minimize on-site and downstream damages to the identified values at risk listed in the critical VARs table, Appendix A. The emergency treatments being recommended by the Holy Fire BAER team are specifically designed to achieve the following results:

Proposed Land Treatments

The objective of the land treatments are to:

A. Minimize the spread of invasive weeds as a result of supression repair activities, mainly dozer lines (L1).

B. Minimize the spread of invasive weeds into the natural vegetative communities with minimal weeds, primarily in riparian cooridors (L2 and L5).

C. Mitigate the hazards to life and safety and protect other BAER critical values (L3).

D. Allow natural recovery of Threatened and Endangered species habitat (L3, L4, L5).

E. Protect natural resources from unauthorized OHV trespass that may prolong recovery rates (L5).

F. Protect historic properties from post-fire threats of erosion, flooding, and sedimentation (L6, P4).

Proposed Road and Trail Treatments
The objective of the road and trail treatments are to:

A. Protect and stablize Forest Service infrastructure at risk of damage as a result of increased sedimentation, stream diversion, and erosion from the fire (R1, R2, R3, T1).

B. Reduce risk to water quality and other natural resources by reducing risk of infrastructure damage and failure (L3, R1, R2, R3, T1).

C. Mitigate public safety hazards along NFS roads and trails (L3, P1, P2).

Proposed Protection/Safety Treatments
The objective of the protection and safety treatments are to:

A. Caution forest visitors recreating and administrative users about the potential hazards that exist within the burned area (L3, P1, P2, P4)

B. Improve public safety by keeping Forest users out of the burn area during major storm events (L3, L5, P1, P2).

C. Prevent transport of potentially hazardous materials off-site that could contaminate waters and habitat downstream (P3, P4).

D. Address hazardous conditions that may exist in and downstream of the burn area, including hazards related to special use permitee infrastructure (P4).

Proposed Channel Treatments
There are no proposed channel treatments.

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

Land 80% Channel____ % Roads 80% Other %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	80	80
Safety	80	80	80
Channel	NA	NA	NA
Roads	90	90	90
Other			

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

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

[x] Hydrology	[**x**] Soils	[x] Geology	[ ] Range	[x] Hazmat
[ ] Forestry	[**x**] Wildlife	[ ] Fire Mgmt.	[x] Engineering	[x] Recreation
[ ] Contracting	[ ] Ecology	[**x**] Botany	[x] Archaeology	[ ]
[x] Fisheries	[ ] Research	[ ] Landscape Arch	[x] GIS	

Team Leader: Kevin Cooper and Emily Fudge (t)

BAER Coordinator: Emily Fudge

Kelsha Anderson-Hydology	Casey Shannon-Hazmat/Recreation
Jonathon Schwartz-Geology	Jay Marshall-Heritage
Tori Stempniewicz-Geology	Eraina Nossa-Heritage
Eric Nicita-Soils	Josh Direen-Engineering
Erik Halverson-Soils	Foster Kuramata-Engineering
Katie VinZant-Botany/Weeds	Marilyn Porter-GIS
Jennifer Howland-Botany/Weeds	Julie Donnell-Wildlife

H. Treatment Narrative:

Land Treatments:

L1. Invasive Weed Detection and Control Treatment Related to Suppression
Weed detection surveys and rapid response eradication treatments are to determine whether ground disturbing activities related to the Holy Incident and the fire itself have resulted in new or the expansion of existing invasive weed infestations. With 98 miles of dozerline, 24 miles of handline, 14 drop points/helispots, and 54 miles of priority riparian corridors in the fire it is expected that new and expanding weed infestations will proliferate in and along these vectors if left unchecked, eventually leading to vegetation type conversion. Surveys and rapid response eradication treatments will begin in 2019 during the flowering periods of weed species. Because of differences in flowering times for all potential species, two visits will be required during the growing season. If timing is such that all the target species are detectable/treatable in one visit, the actual costs would be lower than displayed below. Completion of surveys in riparian areas, dozer lines, staging areas, safety zones, and known invasive plant populations would be the first priority. The second survey priorities would be along handlines and drop points. Surveys of the general habitats in the burned area would be the lowest priority. Detailed weed detection survey guidelines are available in the project record.

L2. Invasive Weed Detection and Control Treatment Related to BAER VARs
Early weed detection and rapid response (EDRR) will be necessary to mitigate the risk of weed introduction and spread in vulnerable areas such as native riparian communities. Prior fires on the CNF have resulted in dense tamarisk populations where populations before the fire were minor or non-existent. Tamarisk has responded aggressively to fire in riparian areas, displacing native riparian vegetation. Weed populations could affect the structure, habitat function, and long-term recovery of native riparian plant communities within the burn area. It is expected that most native vegetation would recover if weed invasions are minimized. Methods for surveys/response are similar to those described in treatment L1.

L3. Burned Area Closure
Currently the Forest has issued a closure area surrounding the Holy Fire. It is recommended that this closure stays in place and the risks associated within the burn scar are re-evaluated prior to lifting the closure. The BAER specialist reports detail the post-fire threats within and downstream of the burn area. Much of the area is subject to post-fire debris flow, rockfall, flooding, erosion, sedimentation, and landsliding that pose a very high risk to

multiple VARs, especially life and safety. Because of the VERY HIGH risk of these post-fire threats, it is recommended that the burned area closure applies to the public, all recreation residences within Trabuco and Holy Jim tracts, FS staff before and during storm events, and trails and roads leading into the burn area. Utilities on the Forest need to coordinate access and should time their work to avoid forecasted storms. NO Forest Service staff should be stationed in Trabuco Canyon at the gate to enforce the closure at the start of or during storms, as the gate is in a very hazardous location in the bottom of the canyon. Anyone who attempts to access the burned area through Trabuco Canyon prior to or during a storm is at a VERY HIGH risk of injury or death or, at the least, entrapment up the canyon; the road in the canyon bottom is very likely to be severely damaged to the point of impassability after a heavy rain.

Funding is requested for adequate gates to close off access to the burned areas in strategic locations. There are also other treatments that will support enforcement of the closure and prevent the need for miles of barrier installation (see Trail Stabilization, Protection and Safety Treatments, P1 – Road Warning Sign and Closure Gates on p11).

L4. Natural Recovery

One federally-listed threatened species, California gnatcatcher, is known from the area within the fire perimeter. Direct and short term impacts to California gnatcatcher include loss of vegetation cover and associated nesting and foraging habitat within suitable and occupied habitat. Treatment for the critical natural value of the federally-threatened California gnatcatcher is natural recovery. It is expected that populations of California Gnatcatcher within the burn areas will be reduced for several years. Overall habitat suitability for this species should recover naturally within 5-10 years post fire. No funding is requested directly related to this treament; however, other treatments will support natural recovery such as L3 (burned area closure) and L5 (OHV trespass prevention patrols).

L5. OHV Trespass Prevention:

Unauthorized access is a threat to the burned watershed due to the dozerlines and open terrain created due to the fire. The CNF is one of the most urban Forest in the nation with one of the highest recreation use levels. The challenge for the CNF is managing the high number of users who gain unauthorized access to the Forest by driving/riding/entering through or around a locked gate or closure sign. This type of unmanaged use can cause damage to natural resources.

Through past BAER experience, the CNF has determined that signage, barriers 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. Prevention patrols are recommended in lieu of adding additonal miles of pipe barrier that may not be effective alone. Prevention patrols are considered a lower cost treatment compared to miles of barrier installation. Should patrols be found to be insufficient, the Forest may reassess and submit an interim request to install barrier at specific locations where unauthorized activity is observed.

L6. Historic Properties Protection:

A cultural resource risk assessment was completed to determine if post-fire conditions pose a risk to cultural resource values. Five sites have been identified as being at “high” to “Very High” risk from flooding and debris flows following major storm events and one site has been identified as an “intermediate” risk from unauthorized OHV incursion.

Three other treatments will also protect two heritage critical VARs, L3. Burned Area Closure, L5. OHV Trespass Prevention, P1. Road Gates, and R2. Road Stormproofing. Burned Area Closure (L3), OHV Trespass Prevention, and Road Gates (P1) will protect identified sites from looting and disturbance by unauthorized OHV trespass until ground covering vegetation regrows. The road treatment (R2) will ensure the road doesn’t washout, protecting the historic VAR at that site.

Coordination and pre-storm treatments are recommended for the NRHP eligible historic cabins that will be impacted by the watershed response. While the cabins are located on NFS lands, they are privately owned and under special use permit. Management of recreation tracts as historic properties by the CNF Heritage Program requires coordinating treatment with cabin owners, CNF staff, and appropriate external agencies. Through coordination, the cabin owners will be able to identify appropriate treatments which allow the cabins to retain

their significant historic character (costs included in P4).
Several recreation tract cabins have been identified as being Very High risk for irreparable damage or destruction from flooding and debris flows. Recommended treatment for these cabins is preservation of the information contained within the cabins. This can be achieved through Historic American Buildings Survey (HABS)/ The Historic American Engineering Record (HAER) level documentation, or through the creation of a digital model (photogrammetry, 3-D modeling) of the cabins. Photogrammetry is the lower cost treatment that will achieve the objective and is recommended.

Roads and Trail Treatments:

Road drainage features are at risk from adjacent burned watersheds. Increased runoff and sediment from the burned areas can negatively affect the road prism, damaging the road, eroding land downslope of the road and routing flow and sediment directly to stream channels. Road failure can also contribute to failure of infrastructure downstream. Culverts associated with these roads are at risk of plugging from debris carried down channels from burned watersheds. A detailed assessment of NFS roads within the burned area was performed and minimum treatment prescriptions were developed to help reduce the risk of road failures to a more acceptable level. Proposed road treatments include: drainage structure cleaning, additional overside drains and riprap spillways, culvert inlet modifications, culvert inlet basin cleaning, berm removal and outsloping, rehabilitation of rolling dips and leadoff ditches, and riprap armoring of slopes and drains.

R1- Storm Inspection/Response: Storm inspection/response will keep culvert and drainage features functional by cleaning sediment and debris from in and around features between or during storms. Storm inspection and response includes approximately 20 miles of NFS roads. This work will be accomplished through contractor equipment and labor. Locations: 1) FSR 3S04, 5S01, 6S13

R2- Road Stormproofing: Road stormproofing involves cleaning or armoring of existing drainage structures, as well as recently installed treatments, and is intended to help ensure road drainage performs optimally and to improve structure performance under increased runoff and debris. This work will be accomplished using contractor equipment and labor. Stormproofing includes approximately 20 miles of NFS roads within the burned area. Locations: 1) FSR 3S04, 5S01, 6S13

R3- Road Drainage Structure Replacement/Improvements: Road drainage structure improvements involves replacing existing deficient structures and installation of additional drainage structures to help ensure road drainage performs optimally and to improve drainage performance under increased runoff and debris . This work will be accomplished using contractor equipment and labor. The proposed treatments are designed to be the minimal treatment necessary to reduce the risk of road failure to an acceptable level. These treatments are located on the segments of road within the burned area and in combination with stormproofing. Locations: 1) FSR 3S04, 5S01

T1. Trail Stabilization
Work will include the installation of drainage features (outsloping, rolling grade dips, knicks, water bars) and snagging trees as appropriate for worker safety. This work is necessary to protect the trail asset by diverting anticipated increases in surface runoff off the trail. This request also includes felling of hazard trees along the portion of trail to be worked on in order to mitigate safety concerns for trail crews as necessary. The trail work will be conducted by ACE crews (contract) or other contract crews and administered and supervised by Forest Service personnel.

FS System Trails in the Holy Fire: After field assessments, it was determined the Trabuco Canyon (#6W04), West and East Horsethief trails (#6W11 and #5N01) are in need of trail stormproofing and stabilization treatments. The identified trails are within the fire perimeter and have high recreation use. Urban areas near the fire area typically attract numbers of trail users, including mountain bike enthusiasts. The trails are located within high and moderate burn severity areas in steep terrain with little to no ground cover or vegetation remaining after the fire. Existing drainage structures are not adequate to mitigate expected increases of post-fire storm runoff. Because of increased runoff due to the fire, trail sections may create erosion channels so will need additional drainage features installed. Trail stormproofing and grade stabilization of 7.6 miles of the trail has been identified

to prevent loss of trail tread, trail structure and reduce soil erosion on slopes. Prior to implementation of treatments, trail specialists will perform specific trail surveys on identified trails. The result of the survey will dictate subsequent detailed storm proofing treatment recommendations. The trails will be monitored post-implementation after winter rain season to determine effectiveness and maintenance needs, and if additional treatments are necessary.

Protection and Safety Treatments:

P1 – Road Warning Sign and Closure Gates
This treatment will install burned area warning signs at key road entry points to caution forest administrative users about the potential hazards that exist within the burned area and will be consistent with the language provided in the BAER Treatments Catalog. The purchase and installation of signs at each of the identified locations will be consistent with Forest Engineering Standards at these locations. A Forest Service employee will inspect the signs for visibility, damage, or loss and replace as needed.

Installation of gates are necessary to support the forest closure and closure treatments. Gate locations are at the south end of 3S04 near highway 74, 6S05 north of Blue Jay and Falcon Campgrounds, the Forest boundary on 6S13 in Trabuco Canyon, and on 3S04 near Santiago Peak. Controlling access up Trabuco is critical because a 2 yr storm is likely to damage this road and trap or injure anyone on it during a rain event. This area is exceptionally hazardous. The Forest should NOT stage FS personnel at the gate to ensure the closure is maintained as the gate location is extremely dangerous during a storm. Secondly, a heavy duty gate is more likely to withstand the flooding and delivery of debris the site is very likely to experience during a storm event. A heavy duty gate will ensure that life and safety are protected and the closure is maintained. This treatment will keep Forest users out of the burned area to mitigate the public safety risk. Work will be accomplished using contractor equipment and labor.

P2. Trail Hazard/Closure Signs
Signs will inform users of the danger associated with entering and using trails and dispersed recreation areas within the burned area, and/or to stay on trails and not go into burned areas. The installation of trail signs include posts and associated hardware. There are a number of portals or access points to these trails. Forest staff will provide oversight for sign installations and implementation. Locations are shown on the treatment map.

P3. Hazardous Material Stabilization
Trabuco Canyon Tract Recreation Residences: 12 permitted recreation residences within close proximity of each other in Trabuco Canyon were burned by the Holy Fire. All of the sites are located within close proximity to Trabuco Creek, a primary waterway in the fire area. When residential structures burn, the ash and residual materials (refuse) is considered hazardous to humans and the environment per the State of California EPA environmental regulations and must be treated and disposed as hazardous materials. Several cubic yards of refuse are exposed and ready to be mobilized off site when storm runoff occurs and could impact riparian habitiat and groundwater. The refuse sites are situated along the base of steep, burned slopes that will likely deliver increased runoff capable of mobilizing materials into Trabuco Creek. Stabilization efforts are essential to prevent mobilization and contamination off-site. Licensed contractors are required to conduct hazardous waste removal or stabilization activities. Recommended stabilization treatments consist of spraying hydromulch on top of burned ash and refuse to protect from direct rainfall impacts and slow runoff. Installation of silt fencing and absorbent chemical booms below direct overland flow pathways will minimize refuse moving off-site. These temporary stabiliazation treatments will stabilize refuse until long-term clean-up can be conducted by permittees. Given the possibility of summer thunderstorms, immediate stabilization treatments are needed. Final clean up actions by permit holders may not be completed before runoff producing storms occur. Estimates for contract specifications are based on current Region 5 IDIQ rates for Hazardous Materials emergency cleanup actions. Other actions needed are 12 underground septic tank contents need to be removed (sewage pumped) and an open water well where the well cover was burned in fire needs replacement to prevent pollution from surface waste and for safety purposes.

P4. Coordination
There is a need for continued coordination to represent the FS during interagency meetings, work with special use permittees, and to distribute public information. Continued distribution of public information is considered essential for public safety in conveying the risk within and downstream of the burn. There are multiple agencies who will be responding to the post-fire threats posed by the Holy Fire burn area. Continued coordination by the FS with these agencies ensures the FS accurately portrays the limits of FS authority and assists when possible and within the limits of FS authority. Communication with special use holders such as the Recreation Residence permittees, Southern California Edison, AT&T, etc., will help to communicate hazards on the National Forest System lands. Additional coordination will be required to process special use requests from the Recreation Residences to clean up the hazardous material, cap the open well, and to stage erosion/flooding protection from the burn area around the cabins, some of which are eligible for inclusion in the National Register of Historic Places.

I. **Monitoring Narrative: NA**