

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

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

B. Type of Action

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

PART II - BURNED-AREA DESCRIPTION

- A. Fire Name: Canyon Fire
- B. Fire Number: CA-ORC-105068
- C. State: CA
- D. County: Orange/Riverside Counties
- E. Region: 05
- F. Forest: Cleveland National Forest
- G. District: 52
- H. Fire Incident Job Code: PNLD5B17
- I. Date Fire Started: September 25, 2017
- J. Date Fire Contained: October 1, 2017
- K. Suppression Cost: \$11 million
- L. Fire Suppression Damages Repaired with Suppression Funds
 - 1. Fireline waterbarred (miles): 5.5 miles Hand Line, 5.3 miles of dozer line on FS
 - 2. Fireline seeded (miles): None
 - 3. Other (identify): 0.5 mi Road repairs
- M. Watershed Number: HUC 12: 180702031002 (Aliso Creek-Santa Ana River), 180702031003 (Lower Santiago Creek)
- N. Total Acres Burned: 2662
NFS Acres (655) State (525) Private (1482)
- O. Vegetation Types: Coastal Sage Scrub, Chamise Chaparral, Scrub Oak Chapparal, Coast Live Oak.

P. Dominant Soils: Cieneba sandy loam, 30-75 percent slopes (21%); Cieneba-Rock outcrop complex, 30-75 percent slopes (10%); Exchequer-Rock outcrop complex, 30-75 percent slopes (36%); Yorba cobbly sandy loam, 30-50 percent slopes (6%); Gaviota very fine sandy loam 15-50 percent slopes (7%); Vallecitos loam, thick solum variant, 15-50 percent slopes (11%);

Q. Geologic Types: Primary rock types are Cenozoic and Cretaceous sedimentary and metasedimentary rocks. Much of the fire area consists of sandstone and conglomerates which were deposited in both mix marine and non-marine environments.

R. Miles of Stream Channels by Order or Class: Perennial = 0 miles, Intermittent = 7.3 miles, Ephemeral=0.97 miles

S. Transportation System

Trails: 0 miles

Roads: 5.5 miles



Canyon Fire – view looking north from fire

PART III - WATERSHED CONDITION

- A. Burn Severity (acres): 191 (7%) (unburned), 1173 (44%) (low), 1298 (49%) (moderate),
0.22 (0.01%) (high)
- B. Water-Repellent Soil (acres): 1298 (49% of fire has water repellency)
- C. Soil Erosion Hazard Rating (acres):
0 (low) 0 (moderate) 2662 (high) 0 (very high)
- D. Erosion Potential after fire: 18 tons/acre Erosion potential before fire: 1.6 tons/acre
- E. Sediment Potential: reported as tons per acre in D.

PART IV - HYDROLOGIC DESIGN FACTORS

- | | |
|---|------|
| A. Estimated Vegetative Recovery Period, (years): | 3-5 |
| B. Design Chance of Success, (percent): | 75 |
| C. Equivalent Design Recurrence Interval, (years): | 2 |
| D. Design Storm Duration, (hours): | 1 |
| E. Design Storm Magnitude, (inches): | 0.63 |
| F. Design Flow, (cubic feet / second/ square mile): | 102 |
| G. Estimated Reduction in Infiltration, (percent): | 50 |
| H. Adjusted Design Flow, (cfs per square mile): | 177 |

PART V - SUMMARY OF ANALYSIS**Background**

The Canyon Fire began on Monday September 25, 2017 around 1pm near the Green River Road exit from east bound highway 91. Wind drove the fire toward Corona and burned through the night. Several neighborhoods in Corona were evacuated as the fire burned up to their properties. The fire moved slowly after Tuesday and was near containment by Sunday.

Approximately 49% of the burn area burned at a high and moderate soil burn severity (see soil burn severity map below). The rest of the fire was either low or very low soil burn severity. It is very important to understand the difference between *fire intensity* and *burn severity* as discussed by fire behavior, fuels, or vegetation specialists, and *soil burn severity* as defined for watershed condition evaluation in BAER analyses. Fire intensity or burn severity as defined by fire, fuels, or vegetation specialists may consider such parameters as flame height, rate of spread, fuel loading, thermal potential, canopy consumption, tree mortality, etc. For BAER analysis, we are not mapping simply vegetation mortality or above-ground effects of the fire, but soil burn

severity. Soil burn severity considers additional surface and below-ground factors that relate to soil hydrologic function, runoff and erosion potential, and vegetative recovery.

On Forest Service land the fire burned Sierra Peak and the surrounding ridges. There are several drainages which flow north from the peak toward Corona which also burned. The drainages have steep slopes that have inherently high soil erosion hazards. Old bulldozer line scars were visible in the fire area as were the subsequent rills and gullies that formed. Erosion at the outlet of most over the side drains along the road was also observed. Fire effects are expected to increase the high erosion hazard due to loss of vegetation canopy, effective ground cover, and formation of water repellent soil layers at varying depths. The burned, steep drainages have the ability to generate sudden releases of storm runoff at high velocities. The ensuing runoff from storm events can also erode and mobilize sediments and debris stored at the base of the slopes and in channel bottoms, leading to deposition of sediment along the lower reaches and in Corona city neighborhoods located in the foothills north of the fire. Loading of sediment from the steep slopes into drainage channel was visible during the BAER assessment.

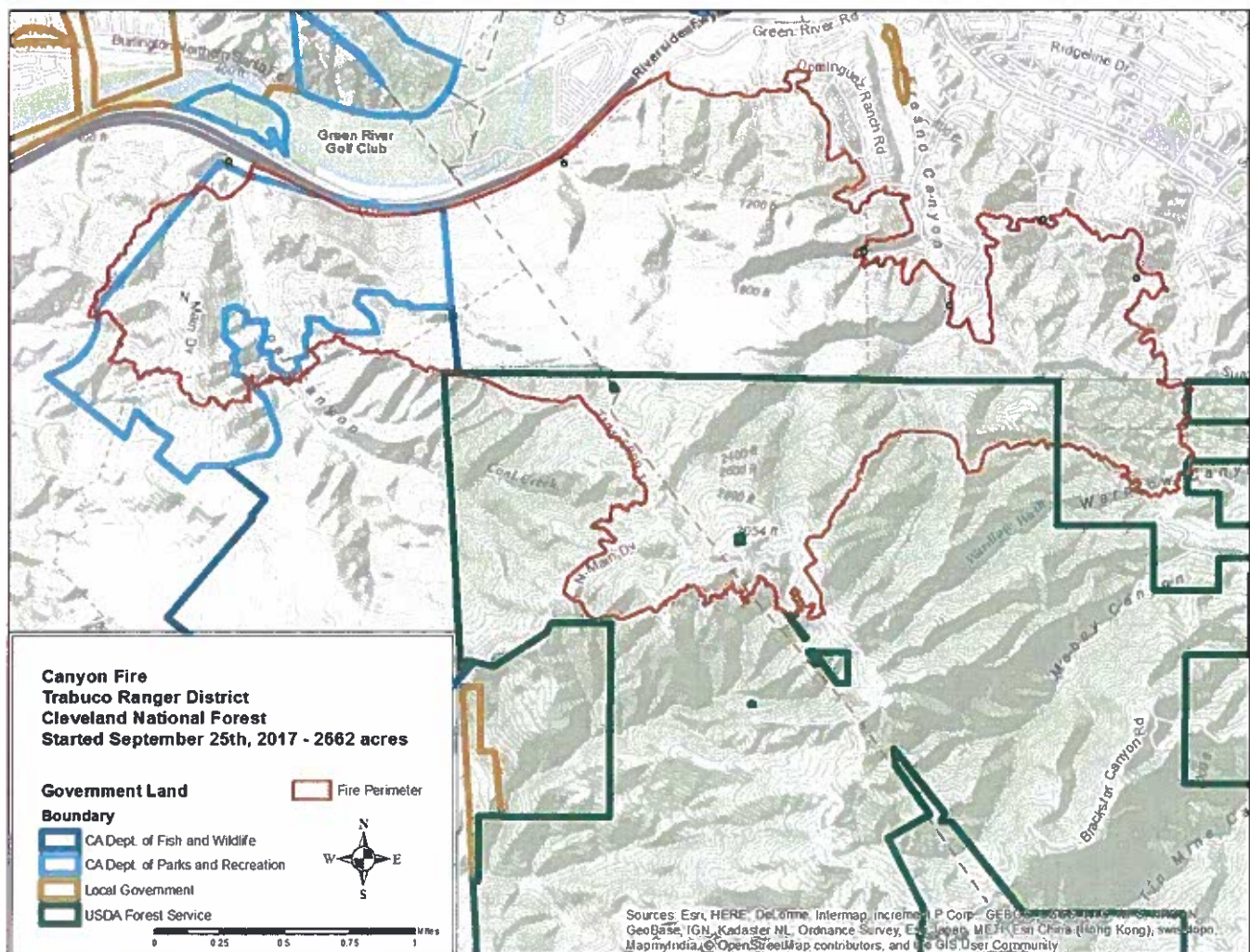


Figure 1 Fire Location

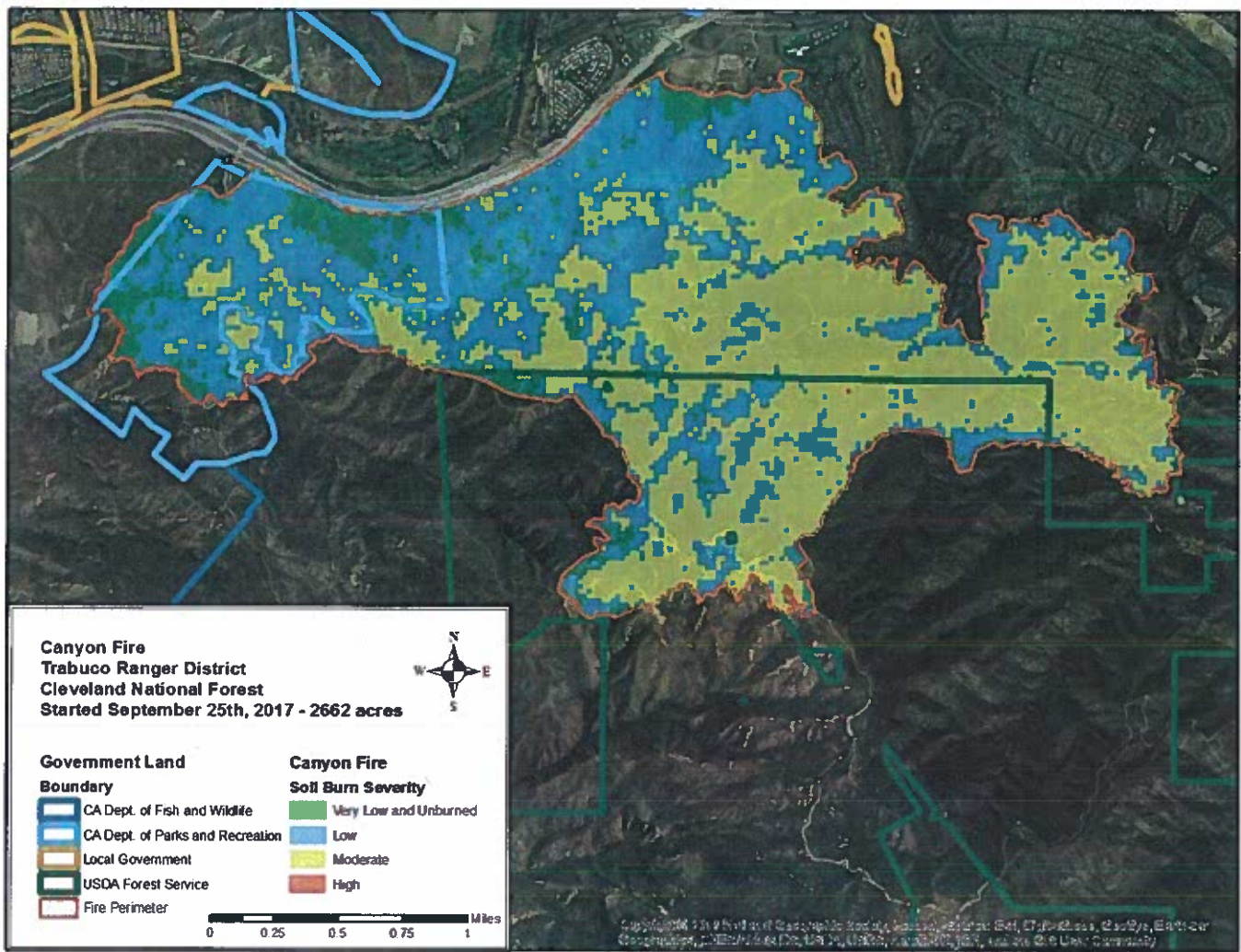


Figure 2 Soil Burn Severity Map

A. Describe Critical Values/Resources and Threats:

The risk matrix below, Exhibit 2 of Interim Directive No.: 2520-2010-1, was used to evaluate the Risk Level for each value identified during the Assessment:

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

Loss of Water Control

The Canyon 2 Fire occurred within 2 6th level HUCs, though only Aliso Canyon on the north side of Sierra Peak burned sufficiently to have potential problem areas downstream of the fire. Additional unofficial 7th field and 8th field HUCs were modeled to show fire effects to specific areas of concern, such as a private land and specific road culverts downstream of the fire. The use of these smaller local subwatersheds provides a more pronounced and indicative increase in water yields by watershed because there is less averaging across unburned areas.

Sediment and peak flow increases have the potential to cause a cumulative debris flow and flooding effect. These effects have varying potentials depending on the size of the burned subwatershed, the slopes involved, and the soil burn severity. This potential for flooding and debris flow has the added risk of causing erosion to Forest Service and County roads, erosion control structures, and buildings on private properties.

Peak discharge increases for the design storm (Q2) range from 2 to 20 times for subwatersheds above the various private parcels within the area of the fire. The variability in the modeling is due to the amount of area in the moderate soil burn severity classification relative to the size of the watershed modeled, the relative slope and time of concentration within the watershed.

The 2-year return interval storm (Q2), with a 50% chance to occur in any given year, and a statistical chance of 75% of occurring at least once in the first 2 years, is modeled to create peak flows on the order of the Q5 to Q20 storms.

The 5-year return interval storm (Q5), with a 20% chance to occur in any given year, and a statistical chance of 36% of occurring at least once in the first 2 years, is modeled to create peak flows on the order of the Q7 to Q50 storms.

Given the high likelihood of these levels of storms occurring in the years following the fire (Q2 75%, Q5 36%), there is between a Possible and Very Likely probability of Damage or Loss Occurring. The various site-specific areas are evaluated for magnitude of consequences, combined with probability, and a Risk is produced (see values at risk table).

Values at Risk and Risk Matrix Table¹

Category	Value at Risk	Potential Threats/hazard type	Ownership	Probability of Damage	Magnitude of Consequences	Risk	Forest Service Treatment Method
Property/Life/Cultural	Sierra Peak Communication Infrastructure	Type of restoration of buildings. Erosion. Compromised structural stability, Hazmat.	SUP	Possible	Minor	Low	Evaluate for eligibility, Sand bags or erosion control around corner of building.
Property/Life	Sierra Peak Communication Infrastructure	Hazmat in buildings, compromised containers, etc	SUP	Possible	Major	High	Have forest SUP contact permittee about Hazmat signs and verify condition.
Property	FR 3S04 (North Main Divide Road)	Erosion on road, at overside drains, sluffing on road, rock fall near the peak.	FS	Likely	Minor	Low	Signs to warn of fire area and risk of flooding and erosion, rock fall, and erosion on the road. Close roads after rain storms. Storm Patrols.

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Life	FR 3S04 (North Main Divide Road)	Erosion on road, at overside drains, sluffing on road, rock fall near the peak.	FS	Possible	Moderate	Intermediate	Signs to warn of fire area and risk of flooding and erosion, rock fall, and erosion on the road. Close roads after rain storms. Storm Patrols.
Property	Trail from North Main Divide Road to Pipeline Truck Trail	Erosion or sluffing on trail, off road unauthorized vehicle use	FS/PVT	Likely	Moderate	High	Check SUP permit. Extend/Install pipe rail barrier. Close road if needed.
Life	Trail from North Main Divide Road to Pipeline Truck Trail	OHV, or bicyclists are injured due to poor road condition	FS/PVT	Possible	Moderate	Intermediate	Signs to warn of fire area and risk of flooding and erosion, rock fall, and erosion on the road. Close roads after rain storms. Storm Patrols.
Property/Life	Canyon Crest Drive	Erosion, Debris Flows, Rock Fall, Flooding	PVT	Possible	Minor	Low	Interagency Coordination
Property/Life	Fresno Canyon Communities	Erosion, Debris Flows, Rock Fall, Flooding	PVT	Likely	Major	High/Very High	Interagency Coordination
Property/Life	Wilderness Drive and streets adjacent to the fire	Erosion, Slumping, Rock Fall, Flooding	PVT	Likely	Moderate	Intermediate	Interagency Coordination
Property/Life	Elderberry Drive Drainage Basin	Fill up/plug culvert	PVT	Likely	Minor	Low	Interagency Coordination
Property/Life	HWY 91	Erosion, Debris Flows, Rock Fall, Flooding	PVT	Likely	Major	Very High	Interagency Coordination
Property/Life	Coal Canyon Roads	Erosion, Debris Flows, Rock Fall, Flooding	PVT	Likely	Moderate	Intermediate	Interagency Coordination

Category	Value at Risk	Potential Threats	Ownership	Probability of Damage	Magnitude of Consequences	Risk	Forest Service Treatment Method
Natural Resource Values	Native Plant Recovery/ Soil Productivity	Invasive/noxious weeds	FS	Very Likely	Moderate	Very High	Detection and eradication. Dozer lines along the road and drainages specifically. Known population of yellow star thistle near Bedford road where heavy equipment from the fire was working and came back to unaffected area. No weed wash on the fire.

Natural Resource Values	Native Plant Recovery/ Soil Productivity	OHV Trespass, Erosion	FS	Likely	Moderate	High	OHV Barriers, Storm Patrols
Natural Resource Values	California Gnat Catcher critical Habitat	Loss of habitat/type conversion	FS	Likely	Moderate	High	Interagency Coordination. Not planning to treat on FS land but to coordinate if seeding occurs on non-federal lands
Natural Resource Values	Water Quality Santa Ana River	Ash, sediment, debris, large woody debris	Mixed	Possible	Minor	Low	

Note: Only values at risk greater than intermediate will be addressed below. County and State property requires interagency coordination.

Threats to Life and Property

Trail from North Main Divide Road to Pipeline Truck trail: Likely damage, Moderate consequences, High Risk.

This trail accesses a powerline and is not a system route. There is recreational use of the road from hikers, bikers, birders, and others. Users are at some risk from unstable rocks after the fire. Erosion and washouts are likely occur on the road/trail. The trail and surrounding areas are vulnerable to unauthorized vehicular use due to areas exposed when the vegetation was burned off. Though the roads are not system roads they are not physically closed to the public. Magnitude of consequences to the trail surface and surrounding areas from erosion, compaction, and new trail creation is estimated to be moderate. Risk is assessed as High.

If there is no necessary administrative use BAER team recommends pipe rail barriers to prevent unauthorized vehicle use on the trail.

Highway 91: Likely damage, Major Consequences, Very High Risk.

Though the highway is protected from most areas of run off from the fire area, the slope south of the highway are steep. Rock fall and sediment may come onto the highway. Because of the heavy traffic on Highway 91 even small amounts of debris on the road could produce a dangerous situation.

BAER team recommends coordinating with Caltrans Division of Maintenance at 916-654-4470.

Downstream Development: Likely damage, Major Consequences, Very High Risk.

Fresno Canyon above Goldenbush Drive: The ~712 acre subwatershed above this branch of the Sierra Peak development is very steep and shows signs of active erosion, even during the vegetated condition. With the removal of the vegetation, there is active wind erosion and dry ravel. Watershed modeling indicates that there will be a loss of water control and the channel will be insufficient to contain the bulked flow. The property upstream on the development has a small road crossing that may be compromised and the primary structure could see sediment laden runoff. There is the potential the private parties could become trapped in the canyon due to this runoff. In addition, there are at least two homes along Saltbush Circle that front the creek with their back yards. The development re-routed the natural drainage of this creek into a narrower channel. Most of the homes are on 10s of feet of fill material with unknown drainage capacity below. In conversation with the President of the HOA and Saltbush Circle homeowner, they expressed the desire to work with the County and NRCS.

Canyon Crest Drive: The BAER team inspected the watershed and undeveloped sediment basin above Canyon Crest Drive. The watershed has a long flat basin (about 500 feet in length) that is below the level of the homes. This area should be sufficient to capture any sediment runoff. The channel would have continued through the neighborhood, but this section of the neighborhood was built on 10s of feet of fill that was used to cover the drainage. There is a trash rack and culvert for water, but the outlet could not be confirmed due to the massive change in the geomorphology of the system due to the development.

Hidden Hills Way: The BAER team inspected the debris basin and inlet to the storm drainage system. The depth of the basin below the level of the houses and street indicate that any generated sediment and flow will be contained within the basin. The trash rack fronting the entrance of the storm drain system was already damaged.

Elderberry Discharge Basin: Similar to the other sections of this neighborhood, Elderberry Circle is built on 10s of feet of fill that has covered the natural drainage channel. The watershed drains to a sediment basin with a drop inlet culvert that drains through and below the fill to an unknown destination. There should be sufficient space for the modeled flow and sediment, but no assessment could be made as to whether or not the drainage culverts were of sufficient size to avoid being plugged.

Coal Canyon Road/Highway 91 crossing: The Highway 91 crossing acts as the drainage outlet for this canyon. This area of the fire had more low soil burn severity in addition to a long low-gradient runout. There was evidence of prior erosional issues from old dozer lines that did not appear to have sufficient drainage features. We sign road and possibly the shore warning public of potential dangers in burned areas. Coordination with the recreation area to warn users of the danger of recreating inside the burned watersheds.

BAER team suggests Interagency Coordination. During Initial Implementation, this treatment will be under the purview of the Implementation Team Leader, working with the NRCS [Robert Hewitt, Robert.hewitt@ca.usda.gov] and coordinating/participating with Forest leadership at public meetings. Private land owners (such as those associated with the Sierra Peak HOA) need to be informed of the potential consequences and programs available to help. Later, during the rainy season, these duties should be assigned to one or more Forest staff. The identified agencies and organizations needing continued interaction include NRCS, City of Corona Public Works [Nelson D. Nelson, Nelson.Nelson@CoronaCA.gov], Santa Ana RWQCB [Adam Fischer, Adam.Fischer@waterboards.ca.gov].

Threats to Ecosystem Stability/Soil Productivity Likely damage, Moderate consequences, High Risk.

Within the fire perimeter, Moderate to High soil burn intensity covered 49 percent of the landscape. 44 percent of the area burned with Low soil burn intensity, 7 percent was very low or unburned. Post-fire field surveys indicate that almost all vegetation cover was consumed during the fire with burn intensities of low, moderate and high.

Watershed Condition Classification: Effects of the Canyon 2 Fire will negatively affect the Indicators of Water Quality, Soil Erosion, Riparian Vegetation, Road Maintenance, and Wildfire Effects. For the Aliso Creek – Santa Ana River (#180702031001) watershed these effects will change the watershed condition from Functioning to Functioning At-Risk.

A primary watershed effect of the Canyon 2 Fire is “Loss of water control” or “Increased Flood Potential.” The design storm (Q2) will cause the watersheds to react as if a Q5 through Q20 storm was occurring. Higher return interval storms, such as the Q5, will cause the watersheds to react as if a Q70 to Q50 storm was occurring. Increases in sediment potential will be 10 to 26 times normal. This level of sedimentation has the potential to decrease the capacity of sediment basins and plug storm drainage features.

Probability of Damage or Loss: Likely. This determination is due to the change in watershed response causing sheet and rill erosion of topsoil. There is some potential for unauthorized off-highway vehicle use within the dozer lines leading to the burn that could be detrimental to vegetation recovery, encouraging noxious weed invasion.

Magnitude of Consequence: Moderate. This determination is due to the change in watershed response causing erosion of topsoil in a fire-adapted ecosystem.

Risk Level: High.

The BAER team recommends installation of OHV barriers if needed and signs explaining the area is a fire recovery site to encourage vegetation recovery, limit weed invasion and protect soil structure. Because of the steep slopes, and size of the fire, large rock content in the soil, and wind presence other treatments to reduce erosion risks are neither economically feasible nor effective. It determined that increased hydrophobicity and channel loading of sediment will increase the risk for other evaluated VARs downstream of the fire area including water quality and risk to recreational uses accessing the fire area.

Threats to Vegetation Recovery and Ecosystem Structure & Function

Most of the vegetation type in the burned area is classified (SRM type) as scrub oak mixed chaparral (591 acres). Other plant associations within the burned area are chamise chaparral (33 acres), coastal sage scrub (33 acres), and Coast Live Oak (18 acres). These vegetation communities are dominated by chamise (*Adenostoma fasciculatum*), California scrub oak (*Quercus berberidifolia*), Eastwood manzanita (*Arctostaphylos glandulosa* ssp. *glandulosa*), Ceanothus species, (i.e. *Ceanothus crassifolius*), holly-leaved redberry (*Ramnus ilicifolia*), birchleaf mountain-mahogany (*Cercocarpus betuloides*), and yerba santa (*Eriodictyon trichocalyx*). Coastal sage scrub is characterized by coastal sage (*Artemisia californica*), with lemonade berry (*Rhus integrifolia*), laurel sumac (*Malosma laurina*), and coyote brush (*Baccharis pilularis*). Live oak woodland is dominated by coast live oak (*Quercus agrifolia*) or canyon live oak (*Quercus chrysolepis*).

Type Conversion of Native Vegetation:

These shrubby plant communities are adapted to *natural* fire regimes and can rapidly regenerate in the burned area by either re-sprouting from underground burls or establishing from seed unless repeated disturbance or high burn severity occurs. Fire typically kills seeds stored on the soil surface; however buried seed tends to remain insulated from extreme heat. Some chaparral species such as manzanita re-sprout from underground burls, and many are adapted to germinate from seed post-fire. Types of disturbance that have potential to threaten vegetation recovery within the burn on Forest Service land include short fire return intervals and invasive non-native plants. Short fire return intervals and high severity burns which wipe out native seed banks can favor rapidly colonizing, non-native species and can type-convert native vegetation to, for example, a community dominated by non-native annual grasses.

Threats to Native Vegetation Recovery from Increase in Noxious Weed Populations:

Invasive plant infestations have potential to increase following a fire due to an increase in available areas for germination, and increased nutrient availability. Heavy equipment used during fire suppression activities is a frequent vector for invasive species introduction. The high-treatment priority species yellow starthistle is known from one road where machinery visited during suppression activities. Other high-priority species could have been brought in from off-Forest on equipment that was not subject to weed-washing. If undetected and untreated, these species could rapidly invade the disturbed areas and inhibit the recovery of native vegetation. In order to reduce the probability of introduction and expansion of invasive weeds in the burn area, an invasive weed survey and rapid-response treatment of these areas are recommended for year one post-fire during the appropriate detection period for these species. Due to differences in flowering times for numerous potential species, two visits may be necessary during the growing season for effective identification and treatment. Invasive weed inventory/treatments will be focused in dozer lines, staging areas and suitable habitat for federally listed and Forest Service sensitive plant species. All locations of priority invasive plant species (following the Cleveland National Forest's Invasive Weed Management EA) will be mapped, evaluated, and hand-treated where feasible.

An emergency exists with respect to vegetative recovery as a result of the threat of post-fire weed introduction and spread. A weed wash station was not onsite at this the fire. Equipment was active when there was no way to know if it was clean, where it came from or what weeds seeds it was carrying. The unknowing introduction and dispersal of invasive weeds into areas made vulnerable by fire suppression and rehabilitation has the potential to establish large and persistent weed populations. In addition, it is highly likely that existent non-native invasive species along fuel breaks will increase in the burn area due to their accelerated growth and reproduction relative to natives, increased nutrient availability, and a release from competition with natives,

becoming an increasingly common component of the vegetation. The increase in non-native invasive species 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 non-native species invasions are minimized.

Approximately 5.5 miles of dozer line were constructed outside the burn perimeter on USFS land and inholdings, including about one mile of a main travel route that was widened by several dozer widths. Dozer line and mechanically cleared areas are the most likely areas for high priority non-native species invasion due to the high potential for introduction of propagules on machinery. In addition to causing an increase in invasive species, the disturbances caused by dozer lines are expected to create accelerated erosion and soil compaction that may also inhibit the recovery of native plant populations.

Probability of Damage or Loss: Likely. This determination is due to the high likelihood of introduction of high priority weeds from suppression activities and the high likelihood of the spread of existing non-native species due to a large increase in vulnerable areas. There is also a potential for unauthorized off-highway vehicle use within the burn area and dozer lines that will be highly detrimental to vegetation recovery and encourage noxious weed invasion.

Magnitude of Consequence: Major. This determination is due to the fact that, if a high-priority treatment species was introduced and not rapidly detected and treated, it could quickly become extremely expensive or unfeasible to treat. There is also a moderately high potential for vegetation type conversion to non-native annual grassland and forbs (ie, Russian thistle, tocalote, black mustard) across the burn area, especially along dozer lines.

Risk Level: Very High. The BAER team recommends early detection and rapid response weed surveys to locate and treat high priority infestations.

Threats to Cultural Resources

05025200112 Sierra Peak Communication Site

The Sierra Peak Communication Site site consists of 12 major buildings constructed over a period of time in a similar style. Most of the buildings are have simple rectangular forms with low shed, gable, or flat roofs. Most of the buildings were constructed in concrete block, but building which appear later are constructed in other material. Each building accompanies a communication steel lattice tower. This site was surveyed on September 30, 2017 and photo-recorded by the BAER team.

Threats to life and property: During the field visit September 30, 2017 by the BAER team, it was noted that one building (Building A) had been visibly burned by the fire and may have to be repaired. Insensitive building repairs may lead to loss of integrity at this unevaluated historical site, as the significance (should it exist) and character-defining features of the component buildings have not yet been determined. The burned Building A and other buildings at the site were marked with "hazard" danger signs. It is possible that the hazardous materials stored in these buildings may have overheated during the fire. This may lead to their becoming unstable and creating further lasting damage to the buildings and environment. Lastly, studying the burn severity and existing signs of erosion at the site led the BAER hydrologists to conclude that there is a pre-existing rill under the northwest corner of Building 5. The potential for damage through future erosion is now exacerbated by lack of vegetation after the Canyon 2 Fire.

Treatments: Building A may require repair by its permittee. It is not known if this building is of historical vintage, but other buildings at the location are historical and there is a continuity of style in these very simple rectangular plan buildings with low or flat roofs and steel lattice towers. In order to avoid losing the visual qualities of this unevaluated site, the permittees of the damaged building should work with their SUP administrator and the Forest Archaeologist to ensure that the building is repaired in kind. Alternatively, the facility could be evaluated to determine significant historical characteristics and whether the site is actually eligible for listing on NRHP; if the site is not eligible care need not be taken to avoid visual impacts.

The SUP administrator should work with the site permittees to ensure that hazardous materials have not been

overheated by the fire or become unstable. In this way, further damage to the buildings and the environment may be avoided.

The pre-existing rill under the northwestern corner of Building 5 already has a retaining wall. The Forest or the permittees should add sandbags to prevent future rain events from exacerbating this erosion.

Main Divide Truck Trail

The Main Divide Truck Trail is the only part of the historical Santa Ana road network lying within the Canyon II burn. The Main Divide Truck Trail starts at the Forest boundary and runs along the ridge route. The current route may be the original one for the most part, but aerial photos shows partly overgrown stretches near Sierra Peak that may represent earlier routes of the truck trail. Drainage features observed on the current route appear to date the 1950s and later: earlier features had half culvert flumes of corrugated sheet metal, while later features appear to have had flumes with longitudinal ridges. In addition to the road and its constructed features, artifacts may also be associated (such as picnic sites, cans tossed from windows). The Main Divide Truck Trail was cursorily recorded from the vehicle. Associated artifacts were found along the road where the BAER team stopped to measure intensity.

Threats to life and property During the field visit September 30, 2017 by the BAER TEAM, a number of constructed drainage features and associated roadside artifacts were found to have been burned by the Canyon II Fire. Overheating the metal material of these features and artifacts may lead to loss of integrity. In addition, loss of drainage feature function may lead to improper drainage and headcutting of the road itself. Increased erosion of the ridge slopes below drainage features may also result due to the lack of vegetation that, before the Canyon II Fire, slowed and dissipated the drainage water. Loss of vegetation and increased erosion may also lead to artifacts on slopes being washed away, or becoming more easily found and carried away by looters.

Treatments: There is really no way to reverse the effect of overheating the metal material of Main Divide Truck Trail features and artifacts, nor future loss of integrity. The road and its associated artifacts should therefore be recorded to avoid losing the scientific, cultural and historical data represented by this road, its features and its associated artifacts. The map of fire history shows that these features and artifacts have probably already been exposed to overheating through wildfires and may already be losing integrity of material. Winter precipitation will also further loss of material integrity.

The map of fire history showing that the area has already been burned since the 1980s suggests that erosion due to burns is not sufficient to carry away the cans that were noted during cursory survey on September 30, 2017: the area has experienced burning and erosion before and yet the artifacts are still there. Artifacts and features on steeper slopes may not fare as well, and this provides another reason for recording the road and its features and artifacts.

B. Emergency Treatment Objectives:

- **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. Further reduce threat to life and safety by installing and maintaining educational/safety signing in hazardous areas and roads until watershed stabilization has occurred and/or the threats/hazards have been removed.
- **Limit Damage to Property**- Roads and trails within and downstream of the burn area are at greater risk from flash flooding and sedimentation after the fire. The treatment objective is to increase the awareness of the public recreational users, LA County, and other agencies of the potentially hazardous conditions resulting from the fire
- **Invasive Plants** - Reduce the potential for impaired vegetative recovery and introduction/spread of invasive non-native plants by conducting detection /rapid response surveys and preventing unauthorized OHV use.

- Road Treatments – Objective is to reduce the threat to life and safety for road and trail users by implementing closures and installing hazard signs and to complete storm patrols and emergency repairs..
- Limit loss of soil productivity –Objective is to decrease rates of runoff water and erosion by conducting invasive species removal and OHV barrier installation.

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

Land 90 % Channel 0% Roads/Trails 90 % Protection/Safety 90 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	90%	80%	N/A
Channel	N/A	N/A	N/A
Roads/Trails	90%	75%	70%
Protection/Safety	90%	80%	75%

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

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input type="checkbox"/> Range	<input type="checkbox"/> Recreation
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input type="checkbox"/> Engineering	<input type="checkbox"/> Lands
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input type="checkbox"/> Hazmat
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

Team Leader: Kelsha Anderson: Cleveland National Forest

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Core Team

Regina Griffith (Archaeologist)

Robert Taylor (Hydrology/Soils)

Jennifer Moore (Botanist/GIS)

Additional Participants

Kirsten Winter (Wildlife Biologist, BAER reviewer)

Foster Kuramata (Roads Manager)

Jake Rodriguez (District Ranger)

Jeff Wells (Wildlife Bio, Resource Advisor)

H. Treatment Narrative:**Land Treatments:***Invasive Plant Detection and Rapid Response*

Invasive non-native plant detection surveys and rapid response eradication treatments are to determine whether ground disturbing activities related to the Canyon 2 Fire and the fire itself have resulted in new or the expansion of existing invasive plant infestations. With 5.5 miles of dozerline associated with the fire and adjacent to a main travel route, 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 2018 during the detection periods of suspected invasive species. Because of differences in flowering times for all potential species, two visits may 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. Surveys in dozer lines, staging areas, and Threatened, Endangered or Sensitive species habitat would be prioritized.

Invasive Plant Detection and Rapid Response Cost

Item	Unit	Unit Cost	# of Units	Cost
1 GS-11 botanist	Days	\$350	6	\$2100
Vehicle gas mileage	Miles	\$0.55	1500	\$825
Supplies			1	\$50
Total Cost				\$2975

Protection/Safety Treatments:*Interagency Coordination*

Interagency coordination started during the fire and continued throughout the BAER Assessment and is a critical component to the BAER process. Continuing this coordination by providing the BAER Assessment Report, specialist reports and attending meetings is anticipated.

Interagency Team Cost

Item	Unit	Unit Cost	# of Units	Cost
BAER Coordinator/Hydrologist	Days	\$400	2	\$800
Vehicle mileage	Miles	\$0.55	200	\$110
Total Cost				\$910

Barriers for Unauthorized Off Road Vehicle Use and Protection Monitoring

Unauthorized access is a threat to the burned watershed due to the dozerlines created for the fire. The CNF is an urban Forest with high 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. In order to manage OHV potential access onto dozerlines and the burned area, the BAER team requests funding to purchase and install pipe rail barriers, which have been proven to be effective barriers on the CNF in past fires.

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. The following treatment is needed.

OHV Barrier Installation and Cost

Item	Unit	Unit Cost	# of Units	Cost
Pipe rail barriers	Foot	\$40	50	\$2000
GS 11 to write contract	Each	\$350	1	\$350
GS-5 OHV - FPO	Day	\$225	10	\$3,375
Mileage	Miles	\$0.55	400	\$220
Total Cost				\$5,945

Road and Trail Treatments – Storm Patrol

Road: This treatment consists of patrolling 4.0 miles of affected road in the burn area from Skyline Drive to the North Main Divide Road and clearing rock and debris fall during and after each rainfall event to reduce the potential for injury to the public and Forest personnel traveling along the road. Patrols would check the road conditions when safe for travel, and if needed deploy a backhoe to assist in the removal of rock and debris.

Road Treatment

Item	Unit	Unit Cost	# of Units	Cost
Storm Patrol	Day	\$300	5	\$1500
Heavy Equipment/Overhead	Day	\$1500	20	\$30,000
Total Cost				\$31,500

Human Life and Resource Protection (Fire Area and Trails Closure/Warning Signs)

To ensure safety for Forest visitors and protection to Forest resources during the recovery period, fire area closure and warning signs will be placed at trailheads and road locations adjacent and within the fire perimeter. It is likely signs will need to be checked and replaced periodically due to vandalism.

Forest Infrastructure: To protect life and property associated with the public use of the trails and roads within and downslope/downstream of the Canyon Fire, the BAER Assessment Team recommends the temporary closure of the burn area to all recreational users when rain is anticipated. Roads will be patrolled after the rain has passed to determine if road damage need to be addressed and if the road is stable enough to open.

Closure and Hazard Signage (Trails, Roads, and Recreation Areas)

Item	Unit	Unit Cost	# of Units	Cost
GS-11 Recreation Officer	Day	\$360	1	\$360
2 GS-5 Recreation Technicians/ FPO	Days	\$440	6	\$2640
Trails warning signs (12"x 18") Hi density plastic.	Each	\$6	10	\$60
Area closure signs (14" x 20")	Each	\$40	2	\$80
Posts and hardware	Each	\$20	12	\$240
Vehicle mileage	Miles	\$.55	400	\$220
Vehicle FOR	Month	\$350	0.5	\$175
Total Cost				\$3,775

Part VI – Emergency Stabilization Treatments and Source of Funds**Initial**

Click red icons for notes.		NFS Lands				Other Lands				Money Left Total \$
Line Items	Units	Unit Cost	# of Units	BAER \$	Spent \$	# of Units	Fed \$	# of Units	Non Fed \$	
A. Land Treatments										
NX Weed Det. Surv.	Ea	2,000	1.0	\$2975	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$2,975	\$0		\$0		\$0	\$0
B. Channel Treatments – none										
				\$00	\$0		\$0		\$0	\$0
Subtotal Channel Treatments				\$0	\$0		\$0		\$0	\$0
C. Road and Trails- Storm Patrol										
Subtotal Road & Trails				\$31,500	\$0		\$0		\$0	\$0
D. Protection/Safety										
Interagency Coordination	ea	\$910	1	\$910	\$0		\$0		\$0	\$0
Closure & Hazard Signage	ea	\$3,775	1	\$3,775	\$0		\$0		\$0	\$0
OHV Barriers	ea	\$5945	1	\$5,945	\$0		\$0		\$0	\$0
Subtotal Protection				\$10,630	\$0		\$0		\$0	\$0
E. BAER Evaluation										
Assessment Team	0520	H5BAER	---	---	\$28,500	---	\$0	---	\$0	\$0
	---	---	---	---	\$0	---	\$0	---	\$0	\$0
Subtotal Evaluation				---	\$28,500	---	\$0	---	\$0	\$0
F. Monitoring										
Subtotal Monitoring				0	\$0		\$0		\$0	\$0
G. Totals				\$45105	\$28,500		\$0		\$0	\$0
Previously approved						Comments:				
Total for this request				\$45105						

PART VII - APPROVALS

1.


 Forest Supervisor (signature)


 Date

2.


 Regional Forester (signature)


 Date