Rough Fire – South Zone

Sequoia National Forest

2500-8 BAER Assessment Report

October 24th, 2015

Little Boulder Grove – Post Fire

Rough Fire – South Zone
Sequoia National Forest
2500-8 BAER Assessment Report
October 24th, 2015
Executive Summary

On July 31, 2015, a lightning strike started a wildfire on the steep northern side of the Kings River Canyon. The Rough fire burned for two and a half weeks within the Sierra National Forest (NF) and grew to 30,000 acres. On August 18, it jumped the south fork of the Kings River and onto the Sequoia NF. The fire burned for an additional six weeks and expanded to over 151,000 acres, with 89% containment. The Rough fire consumed a wide variety of vegetation across both sides of the Kings Canyon Gorge. It burned from blue oak savanna ecosystem type at 1,000 feet elevation to sub-alpine forest at over 10,000 feet elevation, with chaparral, live oak forest, black oak forest, ponderosa pine forest, mixed conifer forest, giant sequoia groves, montane meadows, and red fir forest, in between. Various riparian plant communities are also found along rivers, streams, and within meadows. In the fire area, approximately two-thirds (68%) of the Rough Fire is either very low/unburned to low soil burn severity, while 28% sustained a moderate soil burn severity and 4% burned at high severity.

A Burn Area Emergency Response (BAER) Assessment was conducted in the fire area to determine values at risk, make an emergency determination on those values at risk and make recommendations on reducing the risk to those values.

All values at risk were evaluated and assessed in the fire area. The values at risk that were determined to be an emergency include:

- Threats to forest visitors.
- Threats to property including forest system roads and trails.
- Threats to critical natural resources from invasion of noxious weeds spreading into the fire area and impacting natural vegetative recovery.
- Threats to cultural resources form destabilization, erosion, and looting.

The Initial BAER Assessment Report recommends **$807,671** in costs including the initial BAER assessment and: Mill Flat Campground Closure and Signage; Trail Closure/Hazard Warning Signs; Road Closures/ Hazard Warning Signs; Level 2 Road Storm Proofing (74 Miles); Cultural Resource Protection; Trail Storm Proofing; Invasive Species Early Detection and Rapid Response (50 miles Dozer Line, 14 sites; and BAER Implementation/Administration.

USDA-FOREST SERVICE

FS-2500-8 (6/06)

October 6th, 2015

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: Rough Fire

B. Fire Number: CA-SNF-0011746

C. State: CA

D. County: Fresno, Kings

E. Region: 05

F. Forests: Sequoia NF

G. District: Hume Lake

H. Fire Incident Job Code: P5J0R9 (1515)

I. Date Fire Started: 07/31/2015

J. Date Fire Contained: N/A

K. Suppression Cost: 120 M

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 55 miles
2. Fireline seeded (miles): 0.0
3. Other (identify): None

M. Watershed Numbers:
- 180300100606 (Patterson Creek-North Fork Kings River)
- 180300100605 (Rancheria Creek-North Fork Kings River)
- 180300100702 (Converse Creek-Kings River)
- 180300100704 (Verplank Creek-Kings River)
- 180300100703 (Mill Flat Creek)
- 180300100701 (Tenmile Creek)
- 180300100309 (Lower Middle Fork Kings River)
- 180300100404 (Boulder Creek- South Fork Kings River)

- 180300100403 (Big Meadows-Boulder Creek)
- 180300100402 (Lightning Creek-South Fork Kings)
- 180300100401 (Lewis Creek-South Fork Kings)

N. Total Acres Burned: 151,623
NFS (141,114) Kings Canyon NP (9,413) State (6) Private (1,090)

O. Vegetation Types: The Rough fire consumed a wide variety of vegetation across both sides of the Kings Canyon Gorge. It burned from blue oak savanna ecosystem type at 1,000 feet elevation to sub-alpine forest at over 10,000 feet elevation, with chaparral, live oak forest, black oak forest, ponderosa pine forest, mixed conifer forest, giant sequoia groves, montane meadows, and red fir forest, inbetween. Various riparian plant communities are also found along rivers, streams, and within meadows.

P. Dominant Soils: Excluding rock outcrop and areas located within the national park with no soils data available; the dominant soils in order of dominance include the Coarsegold (12%), Chaix (10%), Entic Xerumbrepts (9%), Holland (7%), and Auberry (5%) soil families.

Q. Geologic Types: Bedrock within the boundaries of the Rough Fire consists of two primary rocks types: Paleozoic meta-sedimentary and meta-igneous rocks and Cretaceous granitics of the Sierra Nevada batholith. Small areas are covered by younger Tertiary volcanics that cap ridges. Surficial geologic units include glacial deposits covering various bedrock units, alluvial gravel and sand of varying ages and surficial scars and deposits from various types of instability features.

R. Miles of Stream Channels by Order or Class: 293 miles of perennial streams, 373 miles of intermittent streams, and 637 miles of ephemeral streams. Total: 1,303

S. Transportation System

Trails: 50 miles Roads: 170 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): unburned/very low – 36,631 (24%); low – 66,497 (44%); moderate – 41,943 (28%); high – 6,031 (4%)

B. Water-Repellent Soil: 28,173 Acres

C. Soil Erosion Hazard Rating:
   a. None: 27,530 Acres
   b. Low: 23,147 Acres
   c. Moderate: 66,031 Acres
   d. High: 34,048 Acres
   e. Very High: 346 Acres

D. Erosion Potential: 6 Tons/Acre

E. Sediment Potential: 3,235 Cubic Yards/Square Mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 2-3

B. Design Chance of Success, (percent): 95%

C. Equivalent Design Recurrence Interval, (years): 2-100

D. Design Storm Duration, (hours): 6

E. Design Storm Magnitude, (inches): 2.2- 4.0

F. Design Flow , (cubic feet / second/ square mile):
- Patterson Creek-North Fork Kings River (11.1)
- Rancheria Creek-North Fork Kings River (11.6)
- Converse Creek-Kings River (10.7)
- Verplank Creek-Kings River (12.9)
- Mill Flat Creek (11.7)
- Tenmile Ceek (13.2)
- Lower Middle Fork Kings River (18.9)
- Boulder Creek-South Fork Kings River (19.3)
- Big Meadows-Boulder Creek (11.2)
- Lightning Creek-South Fork Kings River (17.5)
- Lewis Creek-South Fork Kings River (15.4)

G. Estimated Reduction in Infiltration, (percent): 6 to 72%

H. Adjusted Design Flow, (cubic feet / second/ square mile):
- Patterson Creek-North Fork Kings River (12.8)
- Rancheria Creek-North Fork Kings River (12.2)
- Converse Creek-Kings River (17.2)
- Verplank Creek-Kings River (18.2)
- Mill Flat Creek (20.0)
- Tenmile Ceek (24.2)
- Lower Middle Fork Kings River (39.3)
- Boulder Creek-South Fork Kings River (34.2)
- Big Meadows-Boulder Creek (12.2)
- Lightning Creek-South Fork Kings River (18.8)
- Lewis Creek-South Fork Kings River (23.4)

PART V - SUMMARY OF ANALYSIS

Introduction

On July 31, 2015, a lightning strike started a wildfire on the steep northern side of the Kings River Canyon. The Rough fire burned for two and a half weeks within the Sierra National Forest (NF) and grew to 30,000 acres. On August 18, it jumped the south fork of the Kings River and onto the Sequoia NF. The fire burned for an additional six weeks and expanded to over 151,000 acres, with 89% containment (as of October 4). The Rough fire consumed a wide variety of vegetation across both sides of the Kings Canyon Gorge. It burned from blue oak savanna ecosystem type at 1,000 feet elevation to sub-alpine forest at over 10,000 feet elevation, with chaparral, live oak forest, black oak forest, ponderosa pine forest, mixed conifer forest, giant sequoia groves, montane meadows, and red fir forest, inbetween. Various riparian plant communities are also found along rivers, streams, and within meadows. In the South Zone analysis area (Sequoia NF lands), approximately two-thirds (68%) of the 103,128 acres analyzed by the BAER team within the perimeter of the Rough Fire are either very low/unburned to low soil burn severity, while 28% sustained a moderate soil burn severity and 4% burned at high severity.

Hydrology

The hydrology report focuses on the South Zone of the burn area since an interim report was done for the North Zone in September of 2015. The fire burned from the confluence of the NF Kings in the west (near Pine Flat Reservoir) just beyond Cedar Grove in Kings Canyon National Park to the east. The fire burned north and south of the South Fork Kings River, extending approximately one mile north of Lost Meadow on the Sierra

National Forest and as far south as McKenzie Ridge near Sequoia Lake in the south on the Sequoia National Forest.

The overall soil burn severity showed 4% high, 28% moderate, 44% low, and 24% very low to unburned. Hydrological analysis evaluated 11 HUC12 watersheds and 34 pour points defined at potential Values at Risk. To capture the most probable storm type and the potential "strong" El Nino, 2, 25, 50, and 100 year design storms were used to model the post-fire watershed response. Most HUC12 watersheds and pour points showed minimal increases (<50%) in runoff from fire effects. The most marked changes were found in the Mill Flat Creek and Converse HUC12 watersheds, which showed increases in post-fire runoff by 72% and 61%, respectively. Of the 34 pour points modelled, four showed moderate (50-100%) increases in runoff and four showed high (>100%) increases.

The key Value at Risk that has a potential flood hazard (based on a 2 year, 6 hour design storm), is the Mill Flat Campground at the bottom of Davis Road (12S01). This campground is at the confluence of Mill Flat Creek and the South Fork Kings River. Camping near the creek during the first runoff producing storms could potentially be a risk to life, especially if the SF Kings River is running high, thus increasing the base level of Mill Flat Creek. The recommended treatment is seasonal closure of the Mill Flat Campground by Forest Order and signage notifying the public of the relevant hazards.

Soils

Within the areas identified with a moderate soil burn severity (27.8% of the area) the ground conditions were representative of moderate soil burn severity, see Figure 4 for a visual representation. Ash color varied from black to white and the thickness was commonly less than 1". Minimal consumption of the soil organic matter had occurred and commonly only occurred to ¼ of an inch. Fine roots were frequently present but charred within this same depth range and soil structure varied from slightly too highly altered. Soil water repellency (hydrophobicity) was very patchy and included areas of weak (<10 second) too strongly (>40 seconds) hydrophobic soils. Ground cover varied between 50 to 80% consumption to complete consumption and the canopy varied from partially too completely consumed. With some areas still containing an intact brown canopy and able to provide an influx of ground cover in addition to non-consumed ground cover still present, a less intense watershed response is expected. Infiltration of storm precipitation will vary depending on storm intensity and duration, possibly resembling a high watershed response similar to high SBS areas in the event of a severe storm. In general areas with a moderate SBS will have higher infiltration capacity and greater soil cover retention when compared to areas with a high soil burn severity, resulting in a lesser erosion risk.

The remaining 68.2% of the burned area contained an unburned/very low too low soil burn severity, see Figure 5 for a visual representation. Very little evidence of significant soil heating was observed. No to partial consumption of the canopy had occurred. Ground cover was recognizable with commonly less than 50% ground cover consumption throughout. Ash was generally white with a few occurrences of gray and white ash observed. Very little organic matter was consumed resulting in an unaltered soil texture. Water repellency is hit-or-miss, from slight to severe, and is attributed as natural, not fire-exacerbated. The seed source within these areas would still be present in most of the topsoil and natural understory revegetation is expected to progress without delay. Ground cover was recognizable and less than 20% consumption was commonly observed. Areas within the unburned/very low to low soil burn severities currently have 50 to 100% soil cover and should produce little accelerated runoff or erosion above natural "background" rates.

Geology

Within the burned area of the Rough Fire, some drainages along the Kings River – Hwy 180 corridor show a great deal of past mass wasting as debris slide/rockfall activity that will be increased during future storms. Other watersheds as the Mill Flat Creek, Verplank Creek and Converse Creek 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 are at risk from rolling rock, plugged culverts, debris

slides and in some cases, debris flows. Risks to human life, roads, trails and natural resources is moderate to high in some areas of the Rough Fire.

Even though the USGS debris flow modeling estimates that the majority of drainages along the Kings River have a low probability to produce any debris flow, field and aerial observations confirm that some drainages along the Kings River – Hwy 180 corridor are loaded with large deposits of rock and soil, increasing the threat to human life and safety.

Treatments for debris flow and rock fall hazards include notification of the public of these hazards through warning signs and road closures; clearing and improvement of catch basins and ditches along the road; maintenance and up-grade of drainage structures.

Due to new post-fire conditions rock-fall will likely occur frequently during storm events on the trail leading to Boyden and Church caves. In addition, as a result of excessive flows, sedimentation and debris during storm events some cave entrances that are located at creek/channel level will deliver sediment and debris into the caves, which in-turn might cause damage to geological resources. It is our recommendation to keep the caves close to public access during storm events for the duration of three years following the fire. In addition, monitoring of geological resources in the caves is recommended for this same duration following the fire.

A. Describe Critical Values/Resources and Threats:

Threats to Life and Property

FOREST SERVICE CAMPGROUNDS:
Life and Safety - Hydrologic modelling using a 2 year, 6 hour design storm shows moderate increases in runoff from most of the burn area. As such, hazards from flooding only are limited. The VAR most susceptible to flooding hazard would be the Mill Flat Campground at the confluence of Mill Flat Creek and the South Fork Kings River. A pour point modeled at this location shows an increased runoff of 72% for a 2 year, 6 hour design storm. Although this increase is less than the Q5 response, bulking from ash, sediment, and floatable woody debris could create a possible hazard to campers during the first runoff-producing storms. If a larger storm event occurs as is predicted due to a "strong El Nino", then there could be a flood hazard to camp sites close to the creek. Flood response in Mill Flat Creek could be further accentuated due to an increase in base level if the South Fork Kings is running high. It is recommended that this campground be closed by Forest Order for the 2015-2016 winter season, with signage warning the public of the relevant fire-related flood and debris flow hazards. Total cost (Administration/Installation/Materials) would be $ 2,400.

FOREST SERVICE ROADS: □

Field survey was conducted over September 29 – October 4 (6 days) by the roads engineering team along with field coordination with team Hydrologist, Geologist, and Archeologist. Dominate Forest Service roads within the fire perimeter are;

- 12S01 Davis Road: Provides access to the Kings River from State Highway 180, private property, grazing allotments, several dispersed camping along the road and OHV opportunities.
- 12S19 Delilah: Provides access to Delilah Lookout, private property, grazing allotments, several dispersed camping along the road, and OHV opportunities.
- 13S03 Chicago Stump: Provides access to monumental Chicago Stump and dispersed camping along the road.
- 13S09 Tenmile: Provides access to Hume Lake dam, government facilities, private property (Christian Camp), campgrounds, dispersed camping, day use areas, and recreation trails.
- 13S05 Camp 7 and 13S58 Abbott: Provides access to dispersed camping along the road and access to recreation trails.
- 13S70 Mill Flat Creek, 13S78 Mill, and 13S92 Mill Flat: Provides access to dispersed camping along the road and grazing allotments, and OHV opportunities.

Other secondary roads were also surveyed in the high to moderate burn severity for the purposes of this report; these roads are in the high to moderate burn severity. Approximately 76.75 miles of Forest Service roads are proposed for treatments.

Emergency Determination:

Life and Safety - Risk to road users is determined to be very high with major consequences along Davis Road 12S01. Potential for rock fall, debris flows, and washouts are considered to be very likely the first winter due to the burned watershed on steep slopes above the road. Based on Travel Management, Davis Road 12S01 is open year round for wheel traffic and over snow vehicles. Although the first winter has the highest potential, it is recommended to maintain an effective and consistent closure on Davis Road 12S01 for the first year, and reassess for further closures. Closure applies to wheel traffic and over snow vehicles.

Life and Safety - Risk to road users is determined to be very high with major consequences on the remaining Maintenance Level 2 roads. Potential for rock fall, debris flows, and washouts are considered to be very likely the first winter due to the burned watershed on steep slopes above the roads. Based on Travel Management, these ML-2 roads are closed to wheel traffic during the winter, but open to over snow vehicles. Although the first winter has the highest potential, it is recommended to maintain and effective and consistent closure on these roads for the first year round, and reassess for further closures. Closure applies to wheel traffic and over snow vehicles.

Property - Risk to road improvements and loss of road functions is considered to be very likely with major consequences on road segments along Davis Road 12S01. Diversion of uncontrolled water from road drainage courses on to the road surface, results in degradation and unacceptable erosion, gullies, and loss of road functions and denial of access to road users, grazing allotments, and private property owners.

Property - Risk to road improvements and loss of road function is considered very likely with major consequences on road segments along ML-2 roads. Diversion of uncontrolled water from road drainage courses on to the road surface, results in degradation and unacceptable erosion, gullies, and loss of road functions and inability of private property owners, permittees, and forest users' access.

Treatments to Mitigate the Emergency:

Life and Safety - Proposed BAER road treatments to mitigate the emergency for Davis Road 12S01 are; Install BAER warning signs (entering burned watershed beyond this point) at main entry points of road, install information sign, install rock barriers adjacent to existing gates to discourage OHV usage, inspect road after damaging storms for rock fall, debris flows and washouts, identify problem areas and respond as needed with personnel and equipment as needed when road opens and safe to access.

Life and Safety - Proposed BAER road treatments to mitigate the emergency for ML-2 roads are; Install BAER warning signs (entering burned watershed beyond this point) at main entry points of roads, install information sings, install rock barriers adjacent to existing gates to discourage OHV usage, inspect road after damaging storms for rock fall, debris flows and washouts, identify problem areas and respond as needed with personnel and equipment as needed when road opens during Spring time and safe to access.

Property - Proposed BAER road treatments to mitigate the emergency to invested road improvements, road functions, and assure access to road users in segments of high burned severity along the David Road 12S01 are; Installing drainage armor (riprap), critical dips, armored dips, over side drains w/flume to protect fill slopes, armor low water crossings, culvert inlet modifications (metal end sections), culvert removal and upsize on selected locations, and restore drainage functions on some segments.

Property - Proposed BAER road treatments to mitigate the emergency to road improvements, road functions, and assure access to road users in segments of high burned severity on ML-2 roads are; Installing drainage armor (riprap), critical dips, armor dips, over size drains w/flume to protect fill slopes, armor low water crossings, culvert inlet modifications (metal end sections and risers), culvert removal on selected locations, and restore drainage functions on some segments.

It is recognized that BAER is NOT intended to correct past maintenance deficiencies. The changed conditions due to fire activity has created an urgency for correction and storm proofing of some of these drainage features

on segments along the road, in the high and moderate burned severity on steep slopes above the road.

Proposed Baer Road Treatments:

- Install Road Closure and Information signs.
- Install BAER Warning Signs.
- Boulder Barriers.
- Install Drainage Armor (class 2 & 3).
- Install Critical Dips
- Install Armor Dips (class 2).
- Install Over Size Drains
- Install Low Water Crossing w/ Drainage Armor (class 2 & 3).
- Install Culvert Inlet Modifications (metal end sections & risers).
- Remove and Dispose of Existing Culvert (selected locations).
- Restore Drainage Functions (culvert inlets and outlets, roadway ditch lines rolling dips and water bars w/ run-off-ditch, maintain cross slopes of roads in-slope & out-slope).
- Damage Response & Cleanup (spring).
-

The probability of these accepted and economically proposed road treatments is considered to be at the 80 to 90 percent success rate, dependent on the 2015 /16 winter storm cycles and implementation schedule. Almost 77 miles of roads are proposed for treatment in areas of moderate to high soil burn severity. Implementation cost for emergency road treatments comes to $473,742.

FOREST SERVICE TRAILS

Risks to life and safety may be posed by hazard trees, flooding, debris flows, and falling rocks on trails within or downslope from burned areas. These threats can also affect property by damaging trail infrastructure, which can pose an additional risk to life and safety. Additional risks to property can be posed by burning of trail infrastructure and erosion of trail tread caused by accelerated overland flows concentrating on trails downslope from burned areas. Erosion from the tread can adversely affect natural resources through sediment delivery to streams and critical habitat. Natural resources may also be affected through the burning of natural or constructed barriers, which can lead to off-site natural or cultural resource damage from off-trail travel. Down trees along a trail may also encourage off-trail travel, which can affect natural resources.

Emergency Determination:

Emergency conditions exist for specific trails and sections of trail within the burned area. These emergency conditions are based on threats associated with anticipated post-wildfire impacts to trail infrastructure and trail users. Threats to trail infrastructure includes excessive erosion of the trail tread caused by interception of runoff and capture of streamflow from steep hill slopes and drainages burned subject to moderate and high burn severity. Threats to trail users exist from hazard trees, rock fall, and tread destabilization due to dry ravel, burned stump and root holes, and burned retainers. Table 1 outlines the miles of trail per soil burn severity class.

The cumulative risk to life and safety of National Forest visitors and agency personnel is high along the following National Forest System trails: Boole Tree Trail (28E02), Deer Cove Trail (30E01), Kanawyer Trail (30E04), and Yucca Point Trail (28E01). The potential for intermediate risk from hazard trees and tread destabilization exists along all other trails that were burned.

The cumulative risk to property is high along the following National Forest System trails: Boole Tree Trail (28E02), Deer Cove Trail (30E01), Kanawyer Trail (30E04), and Yucca Point Trail (28E01).

Treatments to Mitigate the Emergency:

Protection and Safety Treatments - Trail Closure and Hazard Warning Signs:
Hazard warning signs should be posted to inform the public of the increased risk to safety in burned areas posed by hazard trees and rock fall. Warning signs should be installed at access points to all trail segments that have been burned and should remain in place for up to 3 years or until potential hazards are mitigated.

Locations of hazard sign installations would be approved by an Archeologist prior to implementation. This treatment would include administrative closure by forest order of the Kanawyer and Yucca Point trails for up to one year or until hazards are mitigated. Closure signs would be installed and removed after the forest order is terminated.

Trail Treatments- Trail Storm Proofing

Storm proofing should occur prior to the first damaging rain events and within the first year following the fire. Treatments would be implemented with hand tools and would include outsloping, berm removal, replacement of burned water bars, maintenance and construction of drainage dips and water bars, installation of armored drainage dips, and installation of armored rolling grade dips where necessary to prevent erosion of the trail infrastructure. Treatment would also include filling of stump holes, replacement of burned log retainers, and removal of dry ravel to prevent destabilization of the tread. All treatment locations and borrow pits would receive archeological clearance prior to implementation. If necessary, an Archeologist would make field visits to determine appropriate locations to borrow soil and rocks needed for filling of stump holes, construction of rock water bars, or armoring of trail tread.

The probability of these accepted and economically proposed road treatments is considered to be at the 80 to 90 percent success rate, dependent on the 2015 /16 winter storm cycles and implementation schedule. Total implementation cost for emergency closure and storm proofing treatments comes to $51,774.

CULTURAL RESOURCES

The vast majority of Historic Properties within the South Zone of the Rough Fire are those associated with giant sequoia logging and transportation systems. This logging system is both a National Register eligible District and a cultural landscape. Broadly defined, cultural landscapes are a reflection of human adaptation and use of natural resources and often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.

The Rough Fire affected the Dunlap Band of Mono's traditional territory and the ethnographic resources of that tribe. Ethnographic resources are basic expressions of human culture and the basis for continuity of cultural systems. These encompass both the tangible and the intangible, and include traditional arts and native languages, beliefs and subsistence activities. Contemporary Native Americans have revealed and archeological evidence suggests several locations within and adjacent to the burned area of significance. The location of these resources is confidential and is retained by the District Archaeologist.

Almost 300 sites were known to exist at the time of the Rough fire event, all sites located in areas of soils subjected to high burn severity were considered at risk for impacts from the fire, suppression activities, or rehabilitation work. For this initial report, approximately 50 sites that were identified as at risk were monitored by BAER team archaeologists. A total of 20 sites have been identified as having values at risk from looting, vandalism, or loss of site features through erosion, tree fall, or root wad upheaval. Twelve highly significant sites essential to understanding the giant sequoia logging systems have been identified for treatments. These treatments are specifically designed to retain site integrity, maintain historic character, and reduce potential losses from looting. 33 sites were assessed but no treatments were recommended. While several sites could not be relocated due to reduced ground visibility caused by ash deposits, other previously unknown sites were exposed by the fire. After visiting a sample of bedrock mortar sites it was determined that such sites would not benefit from any BAER treatment. Many sites were not visited due to difficult access and time constraints.

Emergency Determination:

Due to the probability of loss determination and associated magnitude of consequences resulting in a very high to high risk for cultural sites, a BAER emergency pertaining to heritage resources exists in the Rough Fire Incident Area. Indirect impacts of the greatest concern following the Rough Fire include destabilized watershed conditions, and increased visibility of cultural resources,.

As described in the Hydrology and Geology Assessments, the watersheds encompassed in the Rough Fire are anticipated to experience increased erosion, sedimentation, and mass soil movement (rock fall in particular) as

a result of post-fire conditions. Erosion and sedimentation can mobilize material cultural resources, as well as obscure others through burial. Of particular concern in that regard are prehistoric and historical archeological sites, as well as historic roads and railroad grades in the Davis Road, Abbott Creek, Lockwood and Evans areas. Further, historic rock work along highway 180 is vulnerable to damage from an anticipated increase in rock fall from the burned slopes above.
Looting was documented following numerous fires in the Sierra Nevada (Rim, El Portal, Stanislaus Complex Fire, Pilot Fire, Early Fire, and Telegraph Fire) and has been an issue on the Hume Lake Ranger District. Resource exposure including the removal of vegetative screening from roads and trails can render the sites vulnerable to relic collecting. The removal of fire-exposed artifacts has the potential to threaten these sites eligibility to the National Register of Historic Places and their ability to contribute valuable information to the archaeological record. The magnitude of consequences - defined as the irreversible damage to critical cultural resources - is major.

Treatments to Mitigate the Emergency:

The types and treatments necessary for cultural site protection are as varied as the sites themselves. Please refer to the Cultural Resources report for specifics. At this juncture, 22 specifications are proposed at a total of $195,000.

NATIVE PLANT COMMUNITY RECOVERY

Emergency Determination:

The unknowing introduction of invasive noxious weeds into areas disturbed by fire suppression and rehabilitation has the potential to establish persistent weed populations. These persistent populations could affect the structure and habitat function of plant communities within the burn area. Native vegetation was identified as a Critical Value by the BAER team, as there are few invasive weed infestations present in the majority of the burned area. Forest Service direction is to minimize the establishment of non-native invasive species to prevent unacceptable degradation of the burned area. Consequently, delayed assessment of roads, dozer lines, drop points, and safety zones is necessary to detect the spread and introduction of weeds in the first year after fire. Assessing the establishment of weeds and treating small outlying populations before they expand, will prevent the weeds from becoming serious threats to the recovery of native plants.

Treatments to Mitigate the Emergency:

The presence of known infestations and potential seed bank in the Rough fire and fire perimeter, the lack of early weed washing of fire equipment, as well as the variety of vectors during the course of the fire, invasive plants will have ample opportunities to establish seedlings within the burned area. Careful surveying, mapping and control treatments, especially of new satellite populations, will be essential to reduce this risk. Estimated cost of treatments is $15,165. Losses to ecosystem stability and productivity without treatment are estimatedt to be much greater.

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

Land __ % Channel __ % Roads/Trails **70** % Protection/Safety **100** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land			
Channel			
Roads/Trails	80		
Protection/Safety	100		

E. Cost of Selected Alternative: **$807,671**

F. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Fletcher Linton (Fletcher Linton-Forest BAER Coordinator)

Email: flinton@fs.fed.us Phone: (559) 784-1500 ext 1185 Cell: 559-719-0299

Part VI – Emergency Stabilization Treatments and Source of Funds **Interim #**

Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
Invasive Species Early Detection and Rapid Response (50 miles Dozer Line, 14 sites))							$0		$0	$0
GS-9	Day	7	311	$2,177	$0		$0		$0	$2,177
GS-5	Day	80	156	$12,480	$0		$0		$0	$12,480
Vehicle	Mileage	0.54	700	$378						$378
Misc expenses	Lump	130	1	$130						
Cultural Resource Treatments				$195,000						$130
Subtotal Land Treatments				$210,165	$0		$0		$0	$15,165
C. Road and Trails										
Road Packsge				$473,742	$0		$0		$0	$473,742
Trails Package				$45,285						$45,285
				$0	$0		$0		$0	$0
				$0						
				$0						
Subtotal Road & Trails				$519,027	$0		$0		$0	$519,027
D. Protection/Safety										
Mt Flat Campground Closure and Signage				$2,400			$0		$0	$2,400
Trail Closure/Hazard Warn		0	0	$6,489	$0		$0		$0	$6,489
		0	0	$0						
		0	0	$0	$0		$0		$0	$0
		0.00	0	$0						
Subtotal Structures		0	0	$8,889	$0		$0		$0	$8,889
E. BAER Evaluation										
Initial BAER Assessment				$65,000			$0		$0	$0
BAER Implementation/Adm	Day	431	10	$4,310						
Vehicle Mileage	Mile	0.35	800	$280						
Misc Exp				$0						
Insert new items above this line!					$0		$0		$0	$0
Subtotal Evaluation				$69,590	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
				$0						
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$807,671	$0		$0		$0	$0
Previously approved										
Total for this request				~~$807,671~~						

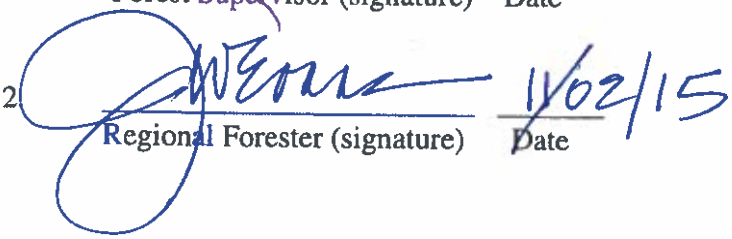
PART VII - APPROVALS

Adjusted to $742,671 after removing Assessment costs

PART VII - APPROVALS

1.  29 OCT 2015

Forest Supervisor (signature) Date

2.  11/02/15

Regional Forester (signature) Date

Figure 1 Soil Burn Severity Map for the Round Fire