

Date of Report: June 26th, 2019**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 rehabilitation measures)
 2. **Interim Report #_1**
 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 DESCRIPTIONA. Fire Name: Camp FireB. Fire Number: CA-BTU-016737C. State: CaliforniaD. County: ButteE. Region: 05F. Forest: PlumasG. District: Feather River (PNF)H. Fire Incident Job Code: PNL6BH (1502)I. Date Fire Started: November 8, 2018J. Date Fire Contained: November 25, 2018K. Suppression Cost: \$82.2 million (reported on November 20, 2018 by Redding Record Searchlight)

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): 0* (20.8 miles of dozer line & 5.6 miles of handline on USFS)
2. Fireline seeded (miles): 0
3. Other (identify): 0

*Note – Due to rains that started on November 21, very few miles of fireline have been waterbarred

M. Watershed Number: 180201210606 (Camp Creek N Fork Feather: 47% burned), 180201210803 (Chino Creek N Fork Feather: 79% burned), 180201210801 (French Creek N Fork Feather: 10% burned), 180201210605 (Grizzly Creek N Fork Feather: 1.3% burned)N. Total Acres Burned: 153,336 (39,019 acres in the BAER runoff analysis area (N Fork Feather))

NFS Acres: 31,235 (26,392 in BAER runoff analysis area) State (??) Private Acres: 122,101

O. Vegetation Types: Sierra mixed conifer consisting of Douglas fir, white fir, ponderosa pine and incense cedar. Oak/chaparral woodlands are found at low elevation and red fir is present above 6000 ft. The shrub layer varies based on elevation; deer brush, whitethorn, chinkapin, manzanita, and redbud are abundant.

P. Dominant Soils: Various complexes formed by Holland, Dubakella, Clallam, Chaix, and Aiken Families (loam, clay loam, clay, and sandy loam textures)

Q. Geologic Types: Intrusive Igneous (granodiorite, gabbro) and ultramafic (serpentinite) geologic types are most common. Metamorphic (schist talc, quartzite) and extrusive igneous (basalt, dacite) geologic types are also present.

R. Miles of Stream Channels by Order or Class within fire perimeter (on burned USFS lands within fire perimeter):

Ephemeral: 150 Intermittent: 97 Perennial: 38 Total: 285

S. Transportation System

Roads (National Forest System): 36 miles Roads (NFS, County, Private): 27 miles

Trails (motorized): miles Trails (non-motorized): miles

PART III - WATERSHED CONDITION

(see attached spreadsheet)

A. Burn Severity (acres): 12,800 (unburned/very low) 17,500 (low) 7,600 (moderate) 1,200 (high)
33% (unburned/very low) 45% (low) 19% (moderate) 3% (high)

B. Water-Repellent Soil (acres): 600

C. Soil Erosion Hazard Rating (acres):

11,141 (low) 20,839 (moderate) 6,936 (high) 103 (very high)

D. Erosion Potential: roughly 35x increase over unburned condition tons/acre

E. Sediment Potential: 109; 7.5 tons/acre (in Flea Creek; SB Mill Creek, respectively, for 5-year storm)

PART IV - HYDROLOGIC DESIGN FACTORS

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

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

C. Equivalent Design Recurrence Interval, (years): 10

D. Design Storm Duration, (hours): 6

E. Design Storm Magnitude, (inches): 3.65

F. Design Flow, Flea Valley Cr & S. Branch Mill Cr, (ft³/ s/ mile²): 216, 268 (respectively)

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

H. Adjusted Design Flow, Flea Valley Cr & S. Branch Mill Cr, (ft³/ s/ mile²): 402, 300 (respectively)

PART V - SUMMARY OF ANALYSIS

Description of Post-Fire Watershed Condition.

In terms of loss of life and private property, the Camp Fire was one of the most destructive fires in California history. The fire started near the small community of Pulga, CA just before sunrise on November 8, 2018 in the Camp Creek and Dogwood Creek watersheds, which are west slope tributaries to North Fork Feather River. Pushed by strong and gusty northeast winds, the fire quickly crossed over the ridge into the West Branch Feather River watershed and within a few hours was burning within the community of Concow (population 700), the City of Paradise (population 26,000), and the community of Magalia, CA (population 11,000). The fire area grew to 70,000 acres within the first 24 hours. More than 13,000 residences were destroyed by the Camp Fire, along with hundreds of businesses. Eighty-five civilian fatalities were confirmed by December 3rd, with 11 persons unaccounted for.

Cal-Fire (an agency of the State of California) managed the incident. Cal-Fire deployed its Watershed Emergency Response Team (WERT) on November 16 to rapidly evaluate post-fire watershed conditions, identify potential values at risk (VAR) related to human life-safety and property, and evaluate the potential for increased post-fire flooding and debris flows. The team also recommended potential emergency protection measures to help reduce the risks to those values. The WERT report was finalized on November 29, 2018. The team produced a Soil Burn Severity (SBS) map based upon November 16 Burned Area Reflectance Classification (BARC) satellite imagery. The WERT performed field verification of SBS, but those field visits, as well as the VARs considered in the WERT report, were focused almost entirely on non-USFS lands within and upstream of the populated areas in the West Branch Feather River watershed.

Since the WERT team has already evaluated non-USFS VARs in the West Branch Feather River watershed (and Butte Creek watershed), the focus of this BAER assessment is to evaluate the risk to USFS VARs in the North Fork Feather River watershed due to increased potential for flooding and debris flows from burned areas in that watershed. USFS lands in the West Branch watershed constitute a very small percentage of the burned area in that watershed, consisting of 18 non-contiguous ("checker-board") parcels of USFS land, with the parcels ranging in size from 40 to 640 acres. The area burned by the Camp Fire within the West Branch Feather watershed totals 44,220 acres, with only 5,510 of those being USFS acres (12%).

The burned area evaluated for increased risk of flooding and debris flows for this BAER assessment is depicted in Figure 1. The North Fork Feather River HUC-6 watersheds affected by the Camp Fire are: Camp Creek; Chino Creek; and very small portions of French Creek and Grizzly Creek. While the BAER assessment for flooding and debris flow risk is focused only on these watersheds, the assessment will include evaluation of risk to native plant communities in the USFS checkerboard parcels in the West Branch Feather River drainage.

The burned area of NFS lands is a mosaic of mostly low and moderate burn severity with some pockets of high severity, with the exception of the Flea Valley Creek Watershed (which has extensive areas of high severity). The burn created several potential flood source areas. The majority of these areas experienced moderate burn severity as far as changes to soil structure and fine root consumption. However, the majority of pre-fire litter on the ground and the needles or leaves on the vegetation were consumed. Therefore, a higher watershed response to rainfall events is expected given the reduced ground cover, duff storage, and infiltration capacity. Most areas of high and moderate burn severity occur in small patches that are buffered by low severity or unburned areas downhill (Figure 2). The sub-watershed with the greatest risk

of increased flows is Flea Valley Creek (a 2,100-acre watershed within the Chino Creek-North Fork Feather HUC-6).

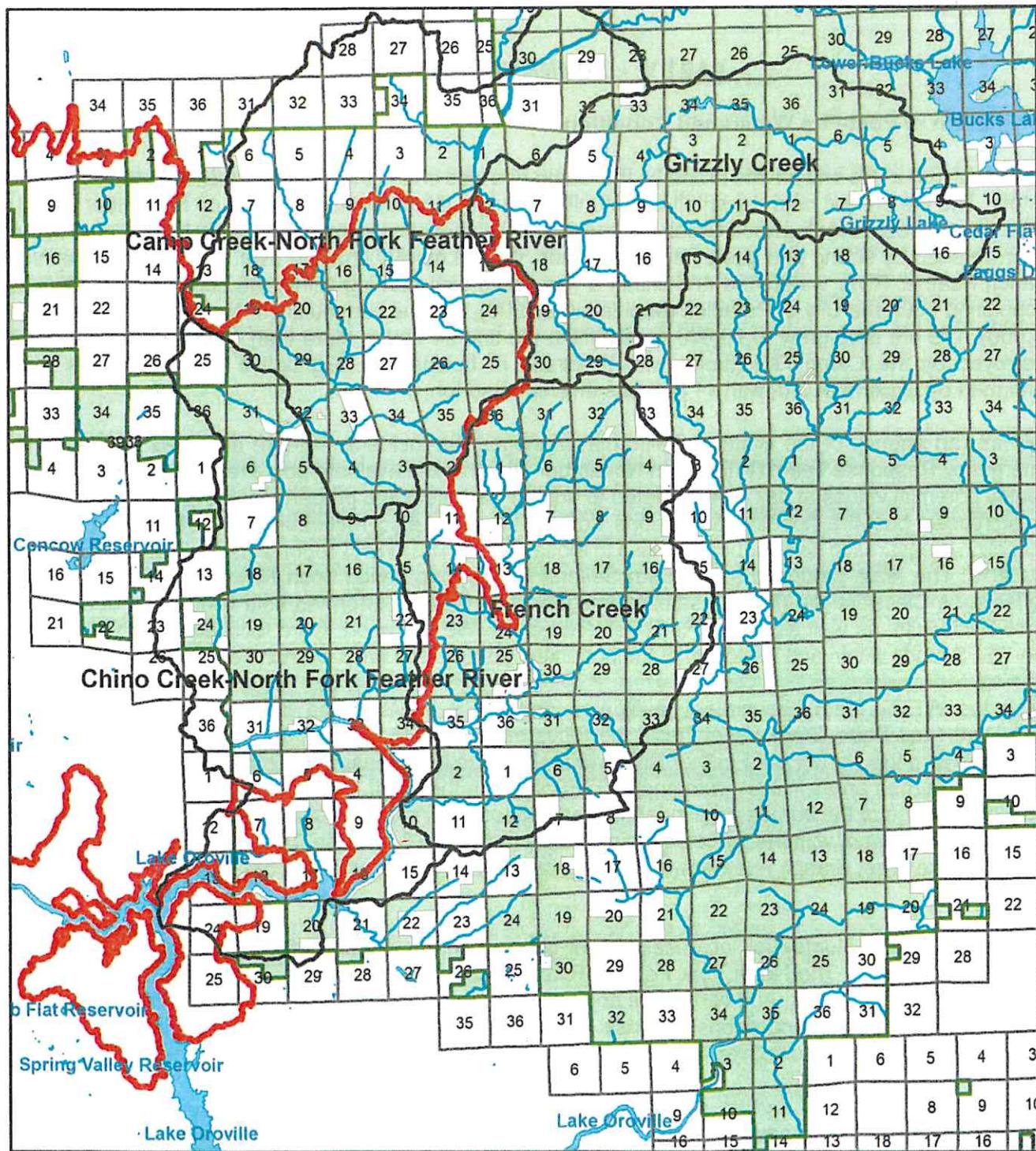


Figure 1: Runoff Analysis Area for this BAER assessment is comprised of the four HUC-6 watersheds affected by the Camp Fire that drain to North Fork Feather River. (Black: HUC-6 Boundaries; Red: Fire Perimeter)

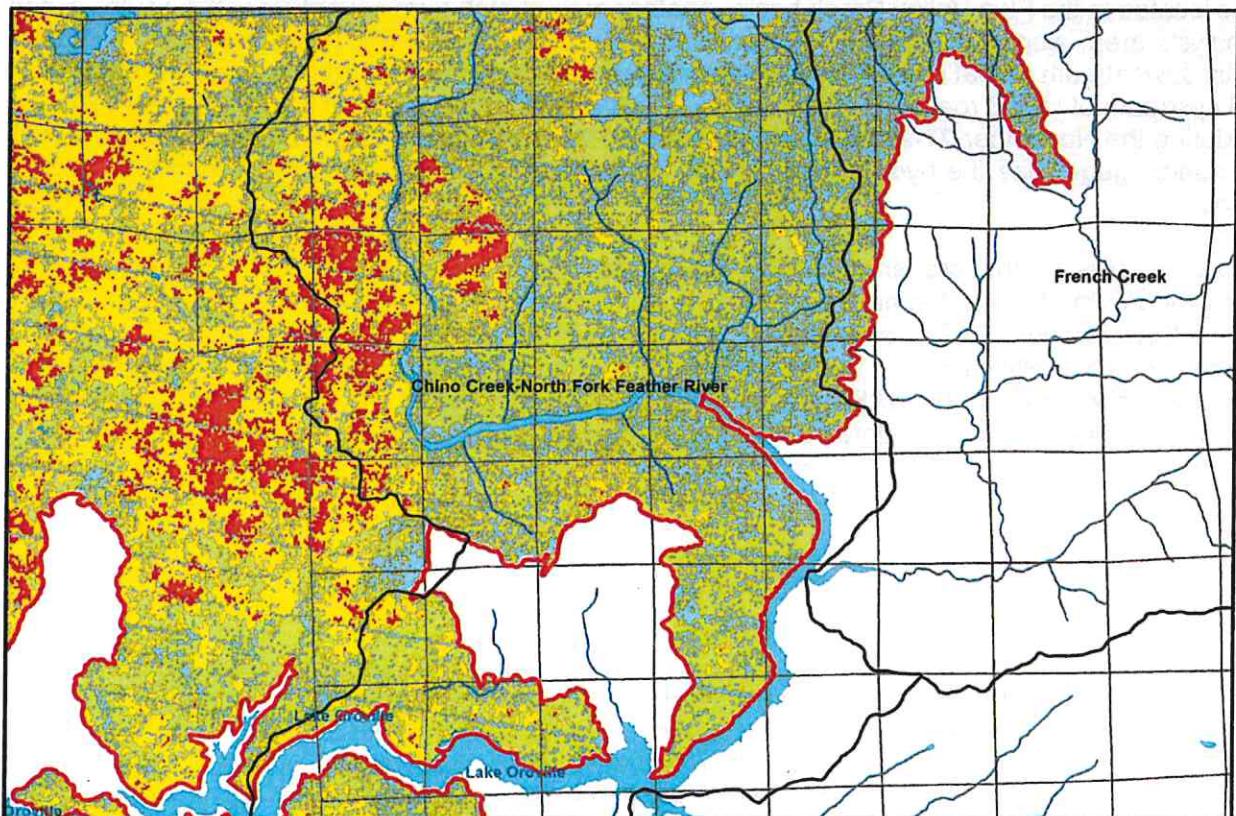
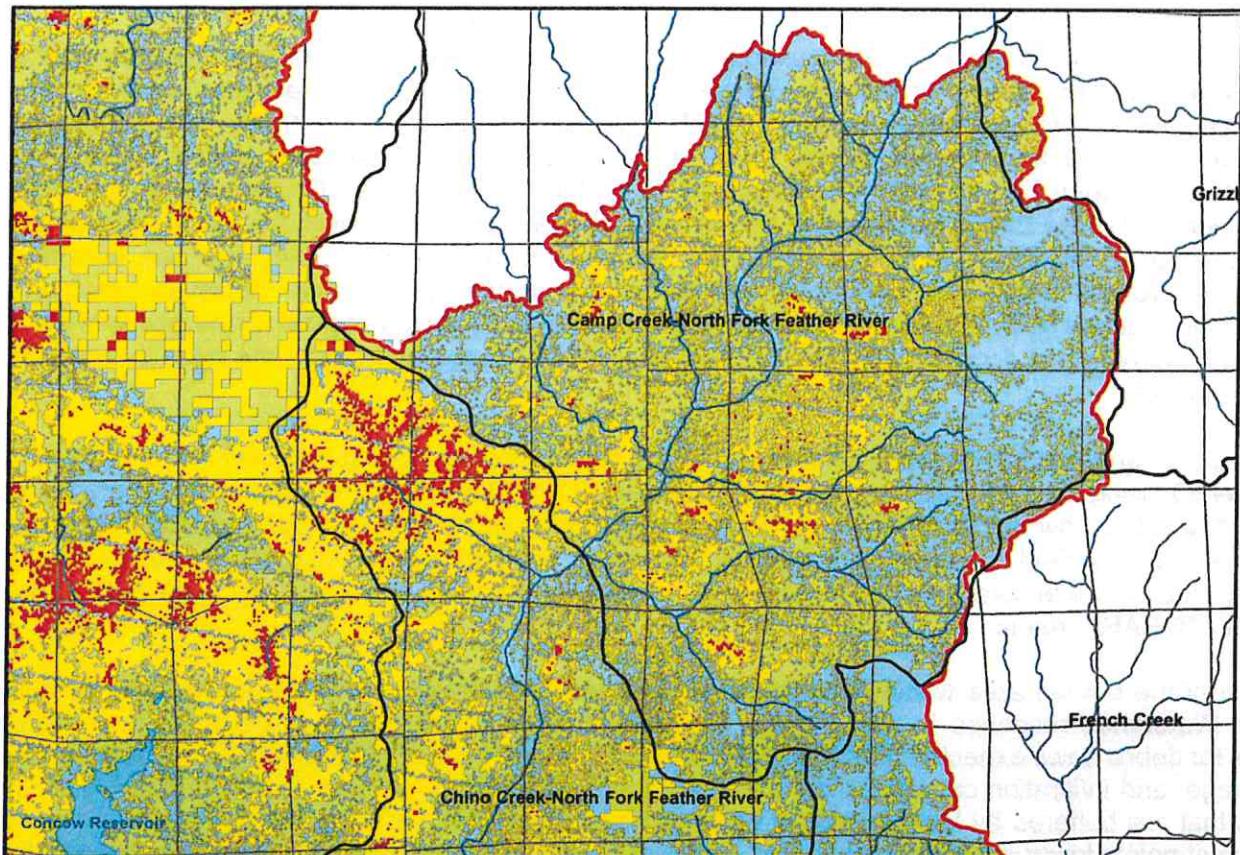


Figure 2: Runoff Analysis Area with Soil Burn Severity (SBS) estimated from December 2nd BARC and November 25 field visit. (Red: High SBS; Yellow: Moderate SBS; Green: Low SBS; Blue: Very Low SBS or Unburned)

The BAER team obtained a burned area reflectance classification (BARC) and Soil Burn Severity (SBS) map upon arrival at the fire on 11/25/2018. These products were developed the previous week by Cal-Fire's Watershed Emergency Response Team (WERT). As explained above, the WERT was focused on the private land around the towns of Magalia, Concow, and Paradise. The WERT team did not visit burned NFS lands in the North Fork Feather River drainage, except for the Flea Valley Creek watershed (where the fire originated). The BAER soil scientist and hydrologist conducted reconnaissance of the fire in the field November 25-26. That BARC and SBS map had been developed before the fire was over and contained errors (the BARC was developed from November 16 satellite imagery). Relatively small and isolated internal areas of the fire turned out to be moderate to high severity though mapped as low. This is likely due to burning that occurred after the November 16 BARC image and before the rains that started on November 21.

The hydrologic analysis for this BAER report (including the numbers presented above) was finished on November 30, using the SBS map derived from the November 16 BARC image. It is likely that the predicted post-fire flow rate is low for South Branch Mill Creek because more pockets of moderate or high severity were observed in the field than were shown on the SBS map. The flow model results for Flea Valley Creek are likely much more accurate because most of the burning in that sub-watershed occurred prior to the November 16 BARC image.

Just 22% of the burned area within the North Fork Feather River drainage burned at moderate or high severity. Watershed response in these areas is expected to be significant, with increased runoff and potential for debris flows expected over the next one to three runoff seasons due to reduced ground cover, duff storage, and infiltration capacity. Most areas of high and moderate severity occur in relatively small patches that are buffered by low severity or unburned areas downhill, reducing the potential watershed response at points lower in the burned basins. The highest concentration of high and moderate soil burn severity is located in the Flea Valley Creek basin. Another area of high burn severity is in the southern half of the analysis area, along CA Highway 70 near Jarbo Gap and Bardee Bar Road; however, no USFS VARs exist downstream of that area. Small pockets of high and moderate severity can present runoff risks if located upstream of USFS roads, as evidenced by a culvert along the 23N00 in the Mill Creek basin that plugged during the November 21-22 rainstorm (see Figure 3). That storm produced a total 2.45 inches of rain at a nearby gage. See the hydrology report for the Camp Fire BAER assessment for more detailed information.

The remaining 78% of the fire area burned mostly as a mosaic pattern of low intensity fire with approximately one-third of the fire area appearing to be unburned or very low fire intensity. Burned Area Reflectance Classification (BARC) satellite imagery was used to initially estimate burn intensity, with the BARC estimations partially verified in the field by the BAER team's soil scientist and hydrologist. Soil burn severity acreages reported in this BAER assessment are for lands burned only in the North Fork Feather River watershed, based upon an updated BARC image from December 2, 2018. **Update 06/26/2019, there were problems getting good BARC imagery that encompassed the whole fire at the end due to cloudy skys. It has been observed that there were many more pockets of moderate burn severity on the east side of the fire. This was observed along the 23N28 road and along the highway 70. A concentrated flow or debris flow plugged a culvert and damaged the access road to the Poe Powerhouse below what was mapped as mostly low severity.**

Soil burn severity was further investigated on the ground within a sample set of moderate and high burn severity areas. Water repellency, also known as hydrophobicity, is present across some of the high soil burn severity (SBS) pockets as well as occasional portions of the moderate SBS. It varies in degree based on soil texture and, to a lesser extent, aspect. Consequently, water repellency is expected to exacerbate runoff production. Approximately 600 acres of the Camp Fire are expected to exhibit water repellent soils. Little to no hydrophobicity was observed in unburned areas within the fire perimeter. Loam and sandy loam soil textures have demonstrated the most consistent and severe water repellency; surface runoff and erosion are expected to be significant in these coarser-grained, steep, denuded slopes. There is high

potential in the Flea Creek watershed for upland soil delivery to the fluvial system. Aquatic habitat and water quality will likely experience episodes of sedimentation.

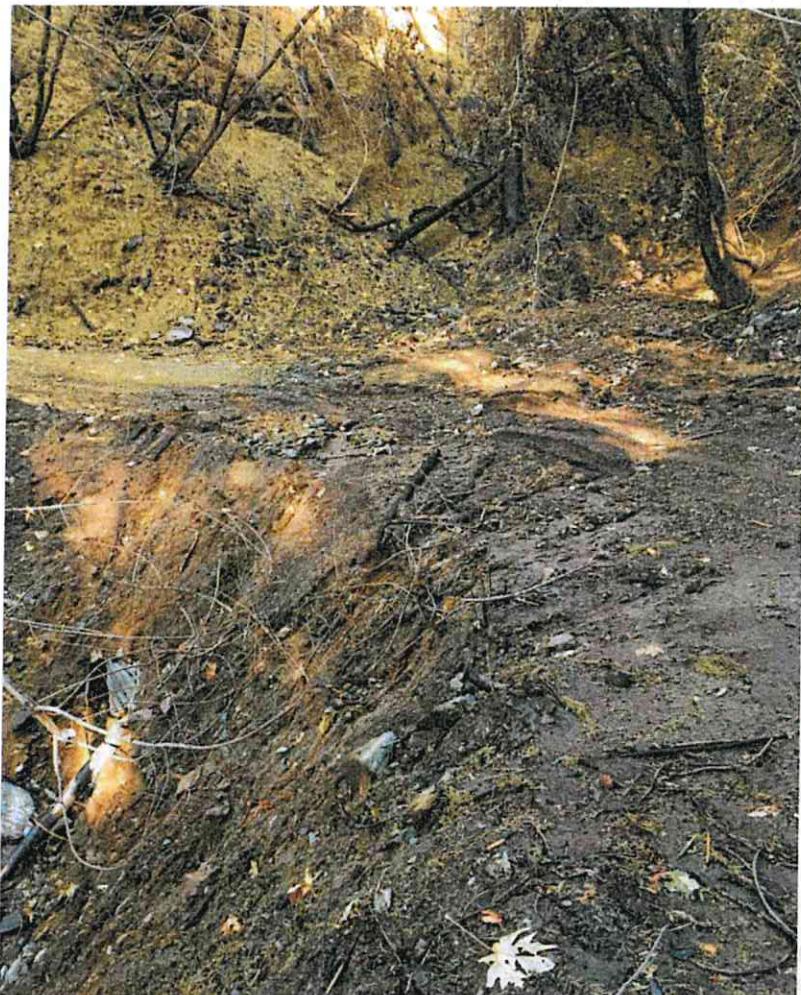


Figure 3: Road 23N00 in the Mill Creek Basin. Runoff from the burned area during storms of November 21-22 plugged the culvert inlet and over-topped the road, causing erosion.

Debris flows with large quantities of boulders, cobble, sediment, and large wood material most often occur during exceptionally high precipitation and streamflow events. Rain on snow events are commonplace in the burned watersheds of the Camp Fire. Some extremely steep slopes in the upper watershed areas have little established vegetation and can act as the starting zone for narrow avalanche tracks. Some historic mass wasting (debris flow) is evident within the fire perimeter, as well as snow avalanche chutes, primarily in the headwaters of the steep ridges that drain to North Fork Feather River

The United States Geological Service (USGS) provides preliminary assessment of post-fire debris flow hazard using empirical models to estimate the likelihood and volume of debris flows for selected basins in response to a design storm. The models are based upon historical debris-flow occurrence and magnitude data, rainfall storm conditions, terrain and soils information, and estimates of soil burn severity. Debris-flow likelihood and volume are estimated for each basin outlet as well as along the upstream drainage networks. The WERT assessment team received GIS output from the USGS model and those results were provided to the BAER team. As expected, Flea Valley Creek is shown to have a high probability of debris flows which are a concern for the values at risk in the sub-watershed. The entire Mill Creek sub-watershed did not get modeled due to errors in the model. South Branch Mill Creek is included in the model results and is shown as having moderate risk for debris flows, which seems reasonable based upon our field observations after the fire was contained

For the Camp Fire, stream crossings along roads below areas of moderate and high burn severity are

particularly at increased risk from rolling rock, plugged culverts, and debris flows. Measures to address debris flow and rock fall hazards from burned areas include: notifying the public of these hazards through warning signs and road closures; clearing and improvement of culvert inlets and inside road ditches; maintenance and up-grade of drainage structures; and the construction of rolling dips in critical locations along National Forest Service System roads and trails.

Many non-native plants are found in California wildlands, but some are much more invasive and noxious than others. Invasive weeds are very effective at occupying disturbed soil and displacing native plants and habitat. Non-native invasive weeds have the potential to displace native vegetation, degrade habitat function, and lower ecosystem stability. Ecological stability relates to the value of native plant communities for wildlife habitat, watershed function, fire regime, and soil condition. The Camp Fire area overlaps with 137 isolated sites where 16 different Region 5 sensitive plants are known to occur. Eighty of those sites occur in one proposed Special Interest Area (SIA) on serpentine soils adjacent to the city of Magalia. The SIA covers 100 acres and contains five R5 sensitive species and PNF watch list species including the rare McNab Cypress. McNab Cypress depends on fire to facilitate germination of new plants. The Camp Fire is likely to result in an abundance of new seedlings while the majority of the existing individuals will likely die. If the existing weeds are allowed to proliferate after the fire without mitigation this population would be threatened because noxious weeds have a competitive advantage over the new McNab Cypress seedlings. See the Noxious Invasive Weeds report for this BAER assessment for more detailed information.

Designated critical habitat for the endangered California Red-Legged Frog (CRLF) exists within the Camp Fire perimeter at Hughes Place. Excessive runoff and sedimentation from burned areas could detrimentally impact this habitat. Unfortunately, the rain and snow storms of late November 2018 prevented the BAER team from being able to access the site. The BARC imagery from December 2 indicated that burn severity upslope of the site was low or unburned. The site will be visited in spring 2019 after road access is again available so that burn severity in the vicinity of Hughes Place can be evaluated.

A. Describe Critical Values/Resources and Threats:

Human Life / Safety:

- There is a potential for roadside hazard trees and rock fall along the roads within and along the fire perimeter. The threat is to life and safety of road users, obstruction of roadway drainage courses, and denial of access until roads can be cleared.
- There is risk to human life should a large debris torrent cause massive flooding at facilities and properties located near the bottom of the Flea Valley Creek and Mill Creek basins.

Property:

- National Forest System (NFS) road infrastructure represents a significant government investment and asset. There are 36 miles of NFS roads within and along the Camp Fire perimeter, all of which are either Level I, Level II or Level III. The value of the road system varies depending on road designs, maintenance and service levels, with the estimated value of the existing road system being \$50,000 to \$250,000 per mile. Until vegetation is reestablished, during high precipitation events the lack of ground cover combined with hydrophobicity of the soils in the areas of moderate and high soil burn severity is expected to result in increased and more flashy runoff; down slope movement of fine ash and sediment; plugging of culvert inlets due to woody debris from burned areas; and possible debris flow. For the Camp Fire, NFS roads are located within and below areas of moderate and high burn severity. In the areas of light and moderate burn severity, some brush remains with ground cover partially consumed. The increase in runoff in these locations will be far lower but transport of woody debris could increase. Roadway ditches, overside drains, natural drainage culverts and cross drains are at risk of losing their drainage function and diverting water onto the roadway when becoming clogged with debris during post burn storm events.

- As described above, facilities and properties located near the bottom of the Flea Valley Creek and Mill Creek basins, could experience damage from large amounts of sediment and debris deposition that could block the channel, causing the creeks to flow through these properties, which include Cal-Trans and Pacific Gas and Electric facilities. Stream crossing structures along CA Highway 70 are also at risk since many of the drainages that flow to the structures were observed to be burned at high or moderate severity.

Natural Resources:

- The potential values at risk, in relation to invasive noxious weeds, are the ecological stability of native plant communities and the degradation of Region 5 Sensitive plant habitat. The existing noxious weeds are very likely to take advantage of the disturbance associated with the fire and displace native vegetation, alter the fire regime, degrade habitat function, and lower ecosystem stability. The disturbed soil as a result of fire suppression activities and the fire itself provide habitat that is highly susceptible to infestation by noxious weeds. During fire suppression activities, Cal-Fire recorded construction or utilization (throughout the entire fire area) of 26 drop points, 6 safety zones, 1 helibase site, and 5 water source sites. Six miles of hand lines and approximately 21 miles of dozer lines were constructed or reestablished on USFS lands during fire suppression activities. In addition, there are approximately 36 miles of USFS roads within or near the fire which could also serve to disperse weed seeds. Roadsides and dozer lines would be most impacted by this threat. Due to the nature of the emergency, no equipment washing station was made available. Dozers, excavators, and off-road vehicles were not washed or inspected prior to entering and working in the fire area. Equipment and vehicles working on the fire were brought in from other areas known to have infestations of noxious weeds. During the BAER team surveys, several noxious weed species were observed at sites of known infestations. The majority of these had been disturbed by both fire and fire suppression activities. Most of the sites visited burned at high severity leaving an abundance of bare soil that is highly susceptible to noxious weed infestation. The majority of the fire occurred on private lands and BAER team surveys did not cover those lands. However, many noxious weed infestations were seen along roads that travel through private lands and provide access to FS lands. Yellow starthistle (*Centaurea solstitialis*) is very common along many of these roads and it is likely to continue spreading onto newly burned and disturbed FS lands.
- Designated critical habitat for the endangered California Red-Legged Frog (CRLF) exists within the Camp Fire perimeter at Hughes Place. Excessive runoff and sedimentation from burned areas could detrimentally impact this habitat. The site will be visited in spring 2019 after road access is again available so that burn severity in the vicinity of Hughes Place can be evaluated.

Cultural Resources:

- Dozens of known cultural resource sites exist within on USFS lands within the fire area (see the final Resource Advisor report for the Camp Fire incident (CA-BTU-016737)). Due to the rain and snow storms that occurred soon after the BAER assessment began, none of these sites have been investigated for risk due to increased watershed response from burned areas. Over the winter, these sites will be compared with the final SBS map for USFS lands so that cultural sites located downslope of moderate and high severity areas can be investigated in spring 2019.

Emergency Determination

The risk matrix below, Exhibit 2 of current national Forest Service Manual 2523 (Directive No. 2520-2017-1), was used to evaluate the Risk Level for each critical value identified during the BAER assessment. Resultant risk determinations of high and very high constitute an emergency to critical values due to the burned area.

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

Human Life / Safety Risk Assessment:

- Hazard Trees and rock fall along NFS roads

The probability of hazard trees falling along NFS roads and impacting Forest visitors, contractors, or employees is possible. The potential consequence if trees were to strike travelers in these areas is major. The risk of this threat is high.

- Flooding at properties downstream of the burned area

For facilities and properties near the bottom of the Flea Valley Creek and Mill Creek drainages, the probability of increased flooding and increased debris flow potential beyond the probability of similar debris flows blocking these streams prior to the fire, is possible (see summary of USGS model results above). However, the likelihood that this flooding would threaten human life is low since people who occasionally occupy these properties are aware that these risks can occur during any high precipitation or rain-on-snow event. The risk of this threat is low.

Property Risk Assessment:

- Forest Service System roads

The probability of increased streamflow, debris, and sediment causing loss of drainage function on NFS roads and causing significant erosion of the road infrastructure is likely. The magnitude of property damage is moderate to substantial. The risk of this threat is high to very high.

- Flooding in residential communities downstream of the burned area

The probability of debris flow deposition (sediment, rock, and large wood pieces) that would cause flooding of facilities and properties near the bottom of the Flea Valley Creek and Mill Creek drainages is possible. The potential consequence of these impacts is moderate, since damage is expected to be localized and repairable. The risk of this threat is intermediate. Extra vigilance is recommended for those owning property at the bottom of these drainages during storm events over the next 2-3 years.

Natural Resources Risk Assessment:

- Native or naturalized plant communities

There is a very likely probability of spread and introduction of invasive noxious weeds into areas disturbed by fire. Damage to these plant communities would be considerable and long-term. The risk of this threat is very high.

B. Emergency Treatment Objectives

Per the national BAER Forest Service Manual risk matrix shown above, emergency situations are determined for a risk (combined probability and magnitude of consequence) of high or very high.

Treatment strategies are prescribed to address these emergency situations. Treatment strategies for intermediate risks may be prescribed depending upon local circumstances.

Treatment strategies are described below. Treatments to protect investments in NFS road infrastructure are installing new or maintaining existing road drainage facilities to control runoff and debris and prevent substantial erosion damage to the road prisms. Treatment objectives also include protecting human life and safety by providing strategically-placed warning signs at NFS roads for hazard tree and rock fall threats. Native and naturalized plant communities are to be protected by inspecting disturbed areas for newly established noxious and invasive weed occurrences and treating these infestations by hand or, where permissible, chemically.

Unfortunately, since the Camp Fire was not contained until late November when the precipitation season was already upon us, access to the road treatment sites will not likely be available until late spring of 2019. So the probability of completing treatments prior to the first major damage-producing storm is low (estimated 10%). **Update 06/26/19, they were not completed.** BAER treatment costs included in this 2500-8 are only for the one highest risk road (23N00), which is the only road that was surveyed in the field by the BAER engineer prior rain and snow storms in late November which closed off access to the burned area. However, it is very likely that the threat to the road system due to increased runoff from the fire will remain for the next few years. An additional roads field survey will likely need to be done in the spring of 2019 to get a more accurate assessment of BAER needs for the road system. Implementation of BAER treatments next summer will prevent further damage to the road system.

C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:

Land n/a % Channel n/a % Roads/Trails 10 % Other n/a %

D. Probability of Treatment Success

		Years after Treatment		
		1	3	5
Land (plant communities)		80	90	90
Channel		n/a		
Roads		80	90	90
Trails		n/a		
Other		n/a		

E. Cost of No-Action (Including Loss): \$800,000

F. Cost of Selected Alternative (Including Loss): \$51,300

G. Skills Represented on Burned-Area Survey Team:

- Hydrology Soils Geology Range
 Forestry Wildlife Fire Mgmt. Engineering
 Contracting Ecology Botany Archaeology
 Fisheries Recreation Landscape Arch GIS

Team Leader

Joe Hoffman, Plumas NF. E-mail: jahoffman@fs.fed.us Phone: (530) 283-7868 FAX: 283-7746

Core BAER Team Members

Craig Kusener, Road Engineer, Plumas NF
 Mike Friend, Botanist, Plumas NF
 Kelby Gardiner, Soil Specialist, Plumas NF
 Kurt Sable, Hydrologist, Plumas NF

BAER Team Trainees

Alicia Goodman, Range Spec (Botany), Plumas NF

H. Treatment Narrative:**Human Health Protection/Safety Treatments:**

- To alert visitors and USFS personnel of hazard tree dangers along roads, install warning signs at strategic locations where the NFS road system enters the burned area and at the termini of heavily frequented NFS roads within the burned area

Item	Unit	Unit Cost	# of Units	Cost
Purchase and install Road Warning Signs for Hazard Trees and Rock Fall	Sign (incl labor)	\$500	2	\$1,000

Property Protection Treatments:

NFS Roads Treatments: Road treatments would be performed on 6.4 miles of NFS road 23N00 within and downstream of moderate and high burn severity areas. Treatments include installation of water control features (rolling dips) to protect the road surface and prevent wash-out of the road prism by adequately dispersing the increased runoff from burned areas. Most of these dips would be armored with small riprap. Relief dips at stream crossings are a highly cost-effective measure to protect the road from washing out if the stream crossing culvert plugs. One riser pipe is proposed for a 36" culvert crossing to prevent loss of function of the culvert due to debris plugging the inlet. Some road repair was performed post-fire on roads within the burn. Some roads were graded, but drainage function was not fully restored and drain inlets/outlets were not all sufficiently cleaned. See the BAER Engineer's specialist report for specific road treatments.

After the winter, we were able to evaluate more roads and see further damage occur on the 23N00 and other roads. The PNF is requesting to treat an additional 13 miles of road including portions of the 23N28, 23N30, and 23N77, and to request further funding for treatments on 3 miles of the 23N00. See Figure 4. Many inlets were plugged and more erosion will follow if drainage is not restored. We may lose entire sections of road. There were two slides on the 23N00 that are now poised to deliver more sediment to Mill Creek but also prevent implementing the originally proposed BAER work. This road provides the only connection to the ridge from the North Fork Feather in the area.

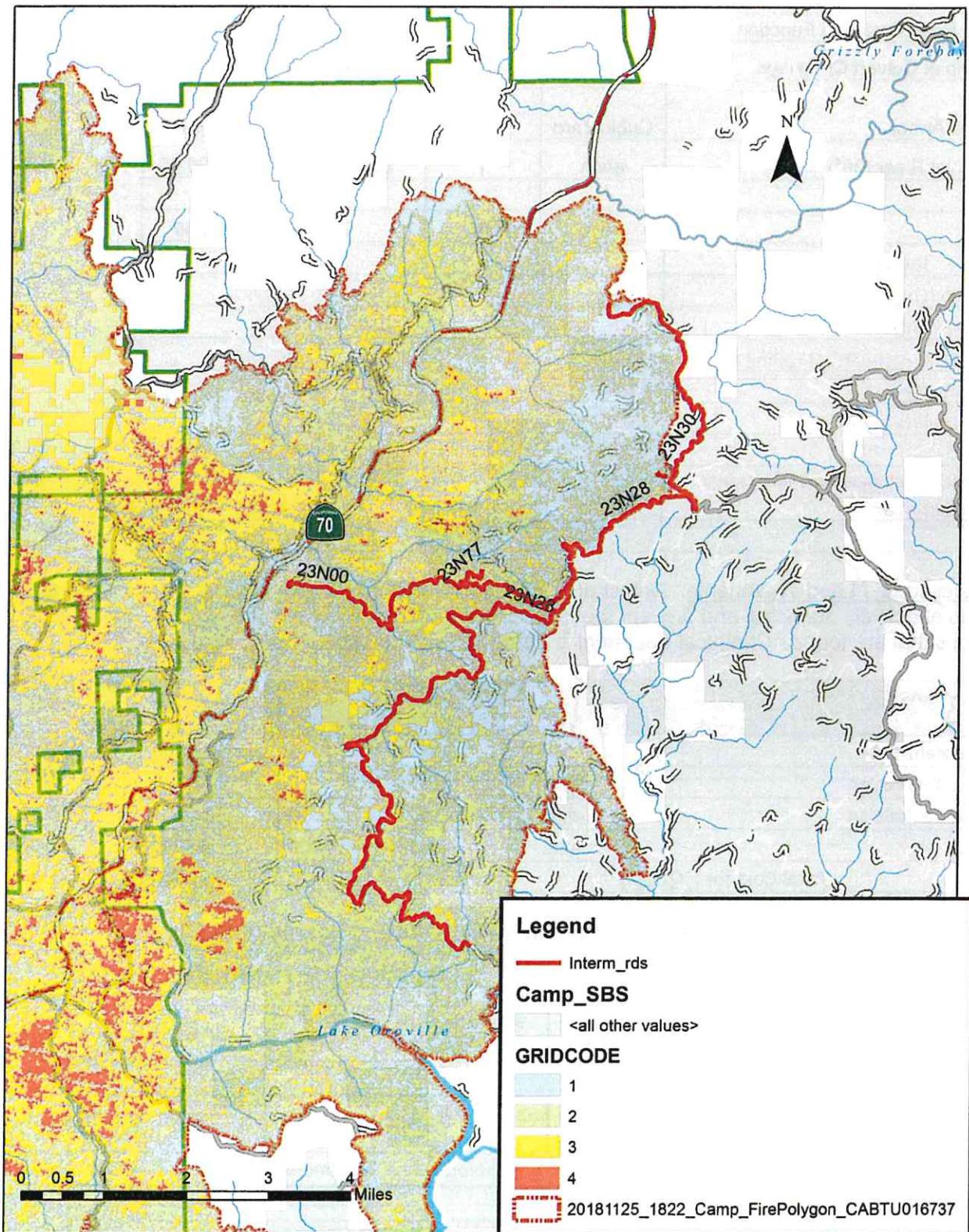


Figure 4. Soil burn severity (SBS) map, higher numbers depict the higher burn severity. NFS roads for treatment roads in red

Road Treatment	Unit	# of Units	Unit Cost	Cost
Restore Road Drainage Function	mile	5	\$3,000	\$ 15,000.00
Relief Dip at Culvert Crossings	each	20	\$1,200	\$ 24,000.00
Drainage Armor	Cubic Yard	20	\$100	\$ 2,000.00
Culver Inlet Riser (36")	each	1	\$2,500	\$ 2,500.00
			TOTAL	\$ 43,500.00
Interim Request				
Clean Catch basin and CMP's	each	15	\$700	\$10,500
Clean inlet only	each	4	\$450	\$1,800
Construct or reconstruct rolling dips	each	13	\$800	\$10,400
Slide removal	each	1	\$7,080	\$7,080
Culvert replacements	each	2	\$2,310	\$4,620
Rip rap	each	1	\$865	\$865
Misc. Road drainage reconditioning. And mobilization				\$18,435
Total				\$53,700

Natural Resource / Land Treatments: Detect new infestations of noxious and invasive weeds while small enough to effectively eradicate and prevent the long-term establishment of new infestations. Hand treat infestations that are found. Chemical treatment is permissible at certain administrative sites.

Item	Unit	Unit Cost	# of Units	Cost
GS-11 Botanist	day	\$400	5	\$2,000
GS-7 Bio Technician	day	\$250	10	\$2,500
GS-5 Bio Technician	day	\$180	10	\$1,800
Mileage	mile	\$0.50	1000	\$500
Total Cost for FY2019				\$6,800

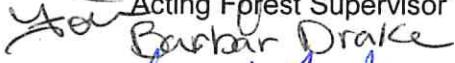
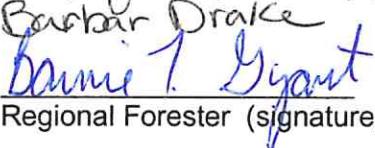
Part VI – Emergency Stabilization Treatments and Source of Funds

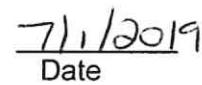
NFS Lands				
Line Items	Unit	Average Unit Cost	# of Units	BAER Funds
A. Lands Treatments				
Weed detection survey and treatment	one season (2019)	\$6,800	1	\$6,800
<i>Subtotal Land Treatments</i>				\$6,800
B. Channel Treatments NONE				
<i>Subtotal Channel Treatments</i>				\$0
C. Roads and Trails				
Road drainage maintenance and treatments	Mile	\$3,400	5	\$17,000

Stream crossing treatments	Crossing	\$1,325	20	\$26,500
<i>Subtotal Roads and Trails</i>				\$43,500
Interim Request				
Road drainage maintenance and treatments	Mile	\$2,923	16	\$46,768
Stream crossing treatments	Crossing	\$2,310	3	\$6,930
<i>Subtotal Roads and Trails</i>				\$53,700
D. Protection and Safety				
Hazard warning signs	Each	\$500	2	\$1,000
<i>Subtotal Protection and Safety</i>				\$1,000
E. BAER Assessment				
Assessment Team	Each	\$16,000	1	\$16,000
<i>Subtotal Assessment</i>				\$16,000
F. Monitoring				
	Total			
<i>Subtotal Monitoring</i>				
G. Totals				
<i>Previously Approved</i>				\$51,300
<i>Totals for this Request</i>				\$53,700

PART VII - APPROVALS


Stacy Henderson 7/1/2019
 Acting Forest Supervisor (signature)


Barbara Drake

Jamie T. Gjant
 Regional Forester (signature)


7/1/2019
 Date


7/6/2019
 Date

