USDA Forest Service

FS-2500-8 (7/00)
Date of Report: 30/October/2019

Burned Area Report

Reference FSH 2509.13

Type of Request

Type of Report

A) ☒ Funding request for estimated WFSU-SULT funds

B) ☐ Accomplishment report

C) ☐ No treatment recommendation

Type of Action

A) ☒ Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)

B) ☐ Interim Report

a. ☐ Updating the initial funding request based on more accurate site data or design analysis

b. ☐ Status of accomplishments to date

C) ☐ Final Report (Following completion of work)

Burned Area Description

Fire Name: Briceburg Fire

Fire Number: CA-MMU-21257

State: CA

County: Mariposa

Region: R5

Forest: Sierra National Forest

District: Bass Lake

Fire Incident Job Code: PNMU06 (1502)

Date Fire Started: October 6, 2019

Date Fire Contained: October 23, 2019

Suppression Cost: $15,500,000 (Est.)

Fire Suppression Damages Repaired with Suppression Funds

A) Fireline Waterbarred (Miles): 21 Miles

B) Fireline Seeded (Miles): 0 Miles

C) Other (Identify): 0 Miles

Watershed Number(s)

A) Ned Gulch-Merced River (180400080501)

B) Bear Creek (180400080502)

C) Saxon Creek-Merced River (180400080503)

Total Acres Burned

A) NFS: 1,830 Acres

B) Federal Other: 2,423 Acres (BLM)

C) Private: 1,344 Acres

D) State: 70 Acres

Dominant Vegetation Types

A) Ponderosa Pine: 2,210 Acres
B) Chamise: 1,592 Acres
C) Interior Live Oak: 755 Acres
D) Canyon Live Oak: 353 Acres
E) Lower Montane Mixed Chaparral: 285 Acres

Dominant Soils

A) MbH2 - Maymen gravelly loam, over 75 percent slopes, eroded: 1,412 Acres
B) 172 - Ultic Haploxeralfs-Dystric Lithic Xerochrepts complex, 15 to 50 percent slopes: 1,234 Acres
C) MbG3 - Maymen gravelly loam, 30 to 75 percent slopes, severely eroded: 905 Acres
D) MaF2 - Mariposa gravelly silt loam, 15 to 50 percent slopes, eroded: 877 Acres
E) MaG2 - Mariposa gravelly silt loam, 50 to 75 percent slopes, eroded: 341 Acres

Geologic Types

A) Phyllite (JTrsb): 4,591 Acres
B) Chert (Trh): 787 Acres
C) Greenstone (JTrsbm): 122 Acres
D) Gabbro (Jmgb): 14 Acres

Miles of Stream Channels (Order or Class)

A) Perennial: 4.2 Miles
B) Intermittent: 17.8 Miles
C) Ephemeral: 21.8 Miles

Transportation System

A) Trails
    a. Motorized: 0 Miles
    b. Non-Motorized: 0 Miles
B) Roads
    a. NFS: 7.7 Miles
    b. Federal Other: 2.9 Miles (BLM)
    c. Private: 0.7 Miles
    d. State: 0.7 Miles

Watershed Condition

Soil Burn Severity

A) Unburned/Very Low: 540 Acres

B) Low: 1,153 Acres

C) Moderate: 3,250 Acres

D) High: 618 Acres

Water-Repellent Soil (Acres): 2,770 Acres

Erosion Potential (Tons/Acre): 13.26 Tons/Acre

Sediment Potential (Cubic Yards/Square Mile): 10,775 Cubic Yards/Square Mile

Summary of Analysis

Watershed Emergency

Over half of the Briceburg Fire burned with either a high or moderate soil burn severity (SBS) accounting for 69% of the fire area; 618 acres (11%) of high and 3,250 acres (58%) of moderate. The remaining 31% of the burned area was either a low or unburned/very low soil burn severity, 1,153 acres (21%) of low and 540 (10%) of unburned/very low. The majority of the high and moderate soil burn severity was found on steep, chamise/chaparral dominated slopes. Within these areas there was a total loss of all effective soil cover, natural re-establishment can take many years to reach pre-burn cover conditions, resulting in excess runoff and erosion until adequate cover is achieved. The combination of soil types (sandy loams & loams), steeper slopes, and lack of soil cover will create a watershed response with elevated hillslope erosion and sedimentation, the degree depending upon the severity of the coming winters over the next 3-5 years.

It is very important to understand the difference between fire intensity or burn severity and soil burn severity as defined for watershed condition evaluation in Burned Area Emergency Response 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. Soil burn severity is not vegetative burn severity or mortality; vegetative burn severity is but one component taken into consideration. Soil burn severity goes beyond aboveground vegetation impacts to belowground soil heating effects and associated impacts to soil. Hydrologic function, runoff, and erosion potential are influenced by pre-fire, fire, and post-fire environments.

Soil burn severity includes careful consideration of factors such as, amount and condition of residual ground cover, viability of native seed banks, condition of residual fine roots, degree of fire-induced water-repellency, soil physical factors (texture, structural stability, porosity, restricted drainage), soil chemical factors (oxidation, altered nutrient status), and topography (slope gradient, length, and profile), and the length of time heat from the fire has been in contact with the soil (residence time). This differs from above-ground vegetation impacts as it is, more related to peak temperatures and fire behavior during the fire.

Areas of high and moderate soil burn severity are considered "flood source" areas and can produce accelerated runoff and sedimentation affecting roads, water quality, and downstream infrastructure. The risk of flooding and erosional events will increase as a result of the fire, creating potentially hazardous conditions within and downstream of the burned area. However if extreme rainfall events occur, high runoff and erosional events could ensue resulting in a further loss of soil productivity, affects to water quality, and an increase in the potential for damage or loss of resource values downstream. While soil erosion is always irreversible, the damage to soil productivity is considered recoverable in most cases, as forest soils are generally resilient and post-fire pulse erosion is a natural geomorphic process.

Soil/Erosion Response

Quantitative erosion figures were estimated using the Erosion Risk Management Tool (ERMiT) batch model. ERMiT is a Water Erosion Prediction Project (WEPP-based application developed by USFS Rocky Mountain Research Station USFS, RMRS-GTR-188, 2007) specifically for use with post-fire erosion modeling. The model estimates only sheet and rill erosion, which occurs when rainfall exceeds infiltration rates, and surface runoff entrains surface soil particles. The model does not account for shallow landslides or gullying, stream-bank erosion, road effects, or fire-line erosion and gullying, which could present large additional sources of sediment entering the fluvial systems.

ERMiT models erosion potential based on single hillslopes, single-storm "runoff events," and post-fire soil burn severity. Hillslopes include soil and topography inputs. Soil inputs include texture and matrix rock content, which was based upon soil map unit information and field verified in many areas of the fire as part of the assessment. Generalized hillslope gradients and profiles were developed in GIS by soil map unit (rock content & soil texture), vegetation, slope, slope length, and soil burn severity class to account for fairly site specific differences in topography.

Various storm runoff-event magnitudes may be chosen in ERMiT for erosion response estimates; 2-year, 5-year, and 10-year events were modeled for this analysis. ERMiT uses the PRISM module to generate climatic input parameters; a customized climate was generated to the latitude/longitude and elevation of the fire area. A 2-year storm event was modeled in ERMiT to determine if the estimated soil erosion for the fire area would affect soil productivity. The modeled 2-year event (50% probability) produced 126,389 tons of sediment equivalent to 13.26 tons per acre or 10,775 cubic yards per square mile (using a conversion factor of 1.35 tons per cubic yard). Increased hillslope erosion is expected to occur throughout the fire area regardless of the soil burn severity. The unburned, pre-fire conditions 2-year storm modeled a total of 4,189 tons of sediment equivalent to 0.47 tons per acre or 357 cubic yards per square mile. The stated accuracy of the model is +/- 50%.

Threats to Life/Safety and Property

National Forest System Roads

The field survey was conducted over the course of 2 days. NFSR is the primary arterial road traversing through the burned area. NFSR 3S12, 4S11, 4S12, and 4S18 ML-2 roads, and are the primary access to Forest Service recreation and administrative sites. The maintenance 2s roads provide access across the forest and are primarily engineered road constructed aggregate base and of native surfaces composed of decomposed granite. Native surface roads composed of decomposed granite are highly susceptible to erosion degradation. The road infrastructure within the burned area is at increased risk of damage and failure due to:

A) Additional erosion damage as a result of increased storm water runoff velocity and volume on and across the roads.

B) Degradation of road surfaces resulting from fire suppression activities.

The potential consequences of the burned area on the roads include:

A) Potential damage and localized failures to road surfaces, road fill slopes, and road drainage structures.

B) Potential secondary impacts to adjacent watersheds as a result of road infrastructure damage and/or road failure.

C) Reduced public safety due to increased hazards resulting from destabilized rock slopes, falling trees, potential debris flows and flooding, and damage to traffic safety structures.

Ecosystem Stability and Vegetation Recovery

Botany

No federally listed Threatened, Endangered, or Candidate plant species nor critical habitat are found in the Briceburg Fire area. Two Forest Service Sensitive plants occur in the burn area, Parry's horkelia was extensively bulldozed along Road 4S11, and will need to be monitored, especially with an eye to preventing invasive non-native weeds hampering its recovery. This rhizomatous, matted member of the Rose Family has rebounded from similar fire suppression activities in the past via seeds and intact underground stems (rhizomes), thus recovery of Parry's horkelia will likely occur acceptably if invasive weeds do not prevail. Mariposa clarkia occur along the Highway 140 corridor where a hand line intersects the Highway just west of Sweetwater Creek. Surveys to ensure that invasive weeds do not gain a foothold and diminish this FS sensitive plant are proposed for summer 2020.

The BAER team determined that it was very likely that fire suppression activities introduced invasive plants into previously uninfested areas, and that the magnitude of consequences to native vegetation from invasive plants was moderate across the entire burn area (partially due to the steepness of the terrain limiting access for fire line construction). The areas that were disturbed by fire line construction or event points (e.g. staging areas, drop points) are extremely vulnerable to germination and spread of invasive weeds the first year after the burn. Therefore, the team determined that invasive plants introduced to new areas by fire suppression pose a very high risk to ecosystem stability and vegetation recovery.

The Incident Command Post at the Mariposa Fairgrounds was not likely to be a top source of invasive weeds introduced to the fire. Rather, risk is high due to the fact that as containment neared, 37 bulldozers were active in the fire. The degree to which those machines arrived with soil and seeds attached is unknown. Thus, the risk of weed introduction and spread during suppression exists throughout the fire area.

Because dozers and excavators working the Briceburg Fire traversed infestations of invasive weeds that were mapped during Ferguson BAER surveys in summer 2019, there is little doubt that movement of invasive weed seeds occurred via equipment, vehicles, and crews during Briceburg fire suppression. Because of this, the burn area is highly vulnerable to rapid establishment of aggressive, damaging, non-native plant species that could alter the function of the ecosystem, the stability of the watershed, and the integrity of the vegetation if not addressed promptly. The Botany Specialist report contains further information and maps showing the locations of known weed infestations in and near the burn area and evaluates the risk in further detail. A budget for conducting Early Detection/Rapid Response surveys and control to minimize the damage that could be caused if the area is left alone is presented in this form.

Emergency Treatment Objectives

A) **Roads:** Protect and stabilize the transportation system roads at risk of damage as a result of increased sedimentation and erosion from the fire, increase protection of water quality by reducing risk of road damage and failure, and mitigate public safety hazards associated with hazard trees, rock fall, and debris flows along NFS roads.

B) **Botany:** The objective of early detection surveys and rapid response treatment (EDRR) is to reduce the potential for expansion of invasive weeds by detecting plants early in the invasion stages. Prompt

eradication of new infestations allows for optimal native vegetation recovery by eliminating competition from invasive species.

Probability of Completing Treatments Prior to First Damage-Producing Storm

A) Land %: N/A, EDRR survey are completed the following year

B) Channel %: N/A

C) Roads %: 80%

D) Trails %: N/A

Table 1: Probability of Treatment Success

Treatment	Years After Treatment		
	1	3	5
Land	N/A	N/A	N/A
Channel	N/A	N/A	N/A
Roads	80	80	70
Trails	N/A	N/A	N/A

Skills Represented on Burned-Area Survey Team

☐ Hydrology	☒ Soils	☐ Geology	☐ Range
☐ Forestry	☐ Wildlife	☐ Fire Management	☒ Engineering
☐ Contracting	☐ Ecology	☒ Botany	☐ Archaeology
☐ Fisheries	☐ Research	☐ Landscape Architect	☒ GIS

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Treatment Narrative

Road Treatments

Proposed BAER road treatments to mitigate the emergency for roads in the High to Moderate burned severity are include; protecting and stabilizing the transportation system roads at risk of damage as a result of increased sedimentation and erosion from the fire, increasing protection of water quality by reducing risk of road damage and failure, and mitigating public safety hazards associated with hazard trees, rock fall, and debris flows along NFS roads.

Table 2: Road treatment costs

Item	Pay Unit	Unit Cost	# of Units	Cost
Clean 24" culvert	Each	$175	5	$875
Repair road fillslope (stump-holes)	Each	$1,750	2	$3,500
Armor ditch	CY	$250	5	$1,250
Restore drainage function	Mile	$3,500	1.6	$5,600
			Total:	**$11,225**

Botany

Suppression disturbance treatments include EDDR surveys on approximately 12.7 miles of dozer line, varying in width from 10' to 150'; 1.6 miles of hand line 20-30' wide; in addition to approximately 10 key event points (mostly focused on Drop Points and staging areas where heavy traffic and soil disturbance raise the odds that invasive weeds are introduced).

Table 3: Botany suppression disturbance treatment costs

Item	Unit	Unit Cost	# of Units	Cost
GS-11 Botanist (Hiring, training, survey/treatments, supervision, reporting)	Days	$400	8	$3,200
2 GS-6/7 Biological Technicians (survey, EDRR control, mapping, reporting)	Days	$190	34	$6,460
Vehicle Mileage	Per Mile	$0.50	800	$400
Materials & Supplies	Each	$600	1	$600
			Total:	**$10,660**

Post-fire threat treatments include treating two acres of French broom seedlings growing on 3S12 (with the areas burned by both the Briceburg and the Ferguson Fire). The seedlings would aggressively treated before they mature while the ground is easy to access and would include the botany staff and other disciplines to quickly complete the treatment.

Table 4: Botany post-fire threat treatment costs

Item	Unit	Unit Cost	# of Units	Cost
GS-11 Botanist (Hiring, training, survey/treatments, supervision, reporting)	Days	$400	2	$800
2 GS-6/7 Biological Technicians (survey, EDRR control, mapping, reporting)	Days	$190	6	$1,140
French Broom Support Staff	Lump Sum	$3,000	1	$3,000
Vehicle Mileage	Per Mile	$0.50	200	$100
Materials & Supplies	Each	$200	1	$200
			Total:	**$5,240**

Monitoring Narrative

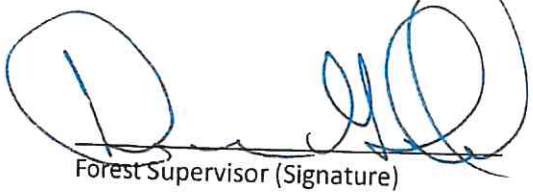
No monitoring is planned to be completed.

Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

Table 5: Briceburg Fire assessment and treatment costs

Line Items	NFS Lands				
	Units	Unit Cost	# of Units	WFSU SULT $	Other $
Land Treatments					
Botany					
EDDR Surveys & French Broom Treatment	Each	$15,900	1	$15,900	
				Total:	**$15,900**
Road & Trail Treatments					
Road Treatments	Each	$11,225	1	$11,225	
				Total:	**$11,225**
BAER Evaluation:				**$5,910.48**	
BAER Evaluation					
BAER team	**Each**				
Total (Excluding BAER Evaluation):				**$27,125**	

Approvals



Forest Supervisor (Signature)

10/30/19

Date