USDA-FOREST SERVICE FS-2500-8 (6/06)

Report Date: 10-17-17

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

[ ] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

[X] 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 DESCRIPTION

A. Fire Name: **Chetco Bar Fire**

B. Fire Number: **OR-RSF-000326**

C. State: **Oregon**

D. County: **Curry**

E. Region: **06 – Pacific Northwest**

F. Forest: **10 – Rogue River Siskiyou**

G. District: **Gold Beach; Wild Rivers**

H. Fire Incident Job Code: **P6K53M17 (0610)**

I. Date Fire Started: **July 12, 2017**

J. Date Fire Contained: **Anticipated October 31, 2017**

K. Suppression Cost: **$69,806,708.00 (as of 10/11/2017)**

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): **179 miles total**
2. Fireline seeded (miles): **179 miles total**
3. Other (identify): **0**

M. Watershed Number(s): (6th level hydrologic units, percent of watershed acres within fire perimeter):

6th level HUC	6th level HUC Acres	% of 6th level HUC Burned
Boulder Creek	13,991	86%
Box Canyon Creek	9,561	51%
Collier Creek	22,891	3%

Eagle Creek-Chetco River	30,830	91%
East Fork Pistol River-Pistol River	18,695	38%
East Fork Winchuck River	23,846	12%
Granite Creek-Chetco River	21,069	71%
Josephine Creek	27,791	1%
Klondike Creek	10,040	4%
Lawson Creek	25,256	0%
Little Chetco River-Chetco River	23,299	19%
Nook Creek-Chetco River	29,150	42%
North Fork Chetco River	25,618	23%
North Fork Pistol River-Pistol River	19,241	17%
Sluice Creek-Chetco River	14,478	81%
South Fork Chetco River	28,821	79%
South Fork Pistol River	16,310	18%
Sulphur Creek-Illinois River	22,284	27%
Tincup Creek	17,748	72%
Upper North Fork Smith River	24,536	7%
Grand Total	425,455	36%

N. Total Acres Burned: **191,197**
NFS Acres (170,321) Other Federal (6,746) State (0) Private (14,130)

O. Vegetation Types: Vegetation varies widely within the Chetco Bar Fire area. Jeffrey pine, western white pine, incense cedar, Douglas-fir, and knobcone pine are common on well-drained ultramafic soils over much of the Kalmiopsis Wilderness in the eastern portion of the burned area. Port-Orford-cedar is found on poorly-drained soils in moderate to high concentrations in the upper portion of the Chetco River, associated largely with wet sites on ultramafic terrain in the Kalmiopsis Wilderness. Huckleberry oak, coffeeberry, small leaf tanoak, labrador tea, western azalea, and tan oak are common shrubs. Concentrations of Brewer spruce are scattered in the Wilderness. The western portion of the Chetco Bar Fire has many hardwood stands which include tanoak, madrone, big leaf maple, vine maple, chinquapin, and alder. The western portion of the burned area also contains old growth stands of Douglas fir as well as numerous Douglas fir plantations. There are many unique habitats within the Chetco Bar Fire which include meadows, rock bluffs, Darlingtonia californica wetlands, springs, ponds, lakes, a diversity of pines and hardwoods, open ultramafic areas with Jeffrey pine savannahs, and the northernmost stands of coast redwood along the lower Chetco River and Wheeler Creek (USDA 1996).

The Kalmiopsis Wilderness is legendary for its diversity of plant life. This is largely a result of plants adapting to the serpentinite and peridotite soils, geological, erosional and depositional influences, and periodic fire regime (USDA 1996). A large number of endemic and sensitive plant populations are associated with the Kalmiopsis Wilderness.

P. Dominant Soils: Siskiyou National Forest SRI (1979), USFS Land: Rock outcrops and Riverwash (25, 542 ac.), Entic Cryumbrepts (29 ac.), Ultic Haploxerolls (95 ac.), Typic Haplumbrepts (52, 641 ac.), Typic Xerochrepts (28 ac.), Dystric Eutrochrepts (170, 823 ac.), Lithic Eutrochrepts (76 ac.), Lithic Xerochrepts (32 ac.), Typic Eutrochrepts (58, 020 ac.), Serpentinitic Typic Xerochrepts (26 ac.), Serpentinitic Dystric Eutrochrepts (19, 550 ac.), Ultic Haploxeralfs (158 ac.), Umbric Dystrochrepts (340 ac.), No taxonomic classification information (504 ac.)

Q. Geology and Geomorphology: The Chetco Bar Fire occurred on the west slope of the Klamath Mountains Geological Province, and through an extension of the California Coast Range Provence. The east side of the Chetco Bar fire burned a large portion of the Kalmiopsis Wilderness, which for the most case overlapped the area that was burned by the 2002 Biscuit Fire. The physiography of the region is dominated by rugged canyons and steep slopes mostly draining into the Chetco River and Illinois River watersheds. Out of 191,197 acres that burned in the Chetco Bar Fire, 80% burned within the Chetco River watershed.

The Klamath Mountains include metamorphosed intrusive rocks and the Josephine Peridotite, a large ultramafic body which supports many endemic plants. The ultramafic rocks consist of peridotite and, where altered, serpentinite (also commonly called serpentine). Amphibole gneisses and schists are believed to be the oldest rocks in the area. These are sandwiched between the ultramafic rocks on the east and the underlying Dothan formation. A thin zone of volcanic rocks which have been warped, dragged, and squeezed into the broad zone of the thrust fault is interpreted to originate from the Jurassic Rogue Formation.

R. Miles of Stream Channels by Order or Class: Perennial: **608 miles** Intermittent: **405 miles**

S. Transportation System: Trails: **48.4 miles** Roads: **see table below**

Road Miles Inside Fire Perimeter by Operational Maintenance Level	
Operational Maintenance Level	**Miles**
4 - MODERATE DEGREE OF USER COMFORT	5.4
3 - SUITABLE FOR PASSENGER CARS	83.4
2 - HIGH CLEARANCE VEHICLES	176.5
1 - BASIC CUSTODIAL CARE (CLOSED)	16.7
DE - DECOMMISSIONED	2.8
Non FS Roads	132.8
Grand Total	417.6

PART III - WATERSHED CONDITION

A. Burn Severity (acres): Total: 36,027 (unburned); 76,613 (low); 64,545 (moderate); 14,012 (high)
NFS Land: 30,642 (unburned); 70,201 (low); 58,784 (moderate); 10,684 (high)

Acres by Burn Severity on FS Lands in 6th-Field Hydrologic Units

	Soil Burn Severity							
Subwatershed Name	High Acres	% Burned	Moderate Acres	% Burned	Low Acres	% Burned	Unburned or Very Low within Fire Acres	% Within Fire
Boulder Creek	828	6%	5,296	40%	5,875	45%	1,153	9%
Box Canyon Creek	266	5%	3,166	60%	1,448	28%	358	7%
Collier Creek	24	3%	261	32%	433	53%	107	13%
Eagle Creek-Chetco River	4,020	13%	13,028	42%	11,033	36%	2,740	9%
East Fork Pistol River-Pistol River	39	0%	2,664	26%	4,487	43%	3,144	30%
East Fork Winchuck River	223	5%	890	19%	1,759	38%	1,799	39%
Granite Creek-Chetco River	451	3%	10,516	64%	3,928	24%	1,570	10%
Josephine Creek		0%	82	39%	82	39%	45	22%
Klondike Creek	6	1%	123	17%	318	44%	280	38%
Lawson Creek		0%		0%	1	86%	0	14%
Little Chetco River-Chetco River	35	1%	2,964	56%	1,477	28%	769	15%
Nook Creek-Chetco River	2,661	15%	3,495	20%	5,962	33%	5,715	32%
North Fork Chetco River	1,637	23%	2,365	33%	1,835	26%	1,299	18%
North Fork Pistol River-Pistol River	0	0%	849	17%	2,404	48%	1,730	35%
Sluice Creek-Chetco River	748	5%	4,026	28%	6,894	48%	2,620	18%
South Fork Chetco River	1,440	5%	6,644	24%	14,823	54%	4,478	16%
South Fork Pistol River	7	0%	847	13%	2,115	33%	3,451	54%
Sulphur Creek-Illinois River	489	6%	2,543	32%	3,043	38%	1,945	24%
Tincup Creek	1,130	7%	4,307	28%	7,372	48%	2,425	16%
Upper North Fork Smith River	5	0%	478	22%	1,324	60%	397	18%
Grand Total	**14,012**	**7%**	**64,545**	**34%**	**76,613**	**40%**	**36,027**	**19%**

B. Water-Repellent Soil (acres): all soils within the burned area exhibit hydrophobic conditions, it is likely that background hydrophobic conditions existed before the fire.

C. Soil Erosion Hazard Rating (acres):
0 (low) **23,936** (moderate) **145,792** (high) **4,022** (rock outcrop/riverwash)

D. Erosion Potential: **45.97 tons/acre**

E. Sediment Potential: **25,890 cubic yards/square mile**

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): **1-3 years grass (achieve % effective ground cover), 5-15 years shrubs, 20-70 years conifers**

B. Design Chance of Success, (percent): **50-90%, depending on site and treatment**

C. Equivalent Design Recurrence Interval, (years): **25-year post-fire**

D. Design Storm Duration, (hours): **24 hours**

E. Design Storm Magnitude, (inches): **8.7"**

F. Design Flow, (cubic feet / second/ square mile): **varies by drainage - see hydro report**

G. Estimated Reduction in Infiltration, (percent): **there was already an induced background hydrophobicity, so the fire did not result in substantially increased hydrophobic conditions**

H. Adjusted Design Flow, (cfs per square mile): **N/A**

PART V - SUMMARY OF ANALYSIS

Background: The Chetco Bar Fire was started by a lightning strike in the Kalmiopsis Wilderness near the Chetco River. It was reported on July 12th, 2017 at 1:45 PM. By July 15th, it was primarily burning in the 2002 Biscuit Fire scar and had only burned 45 acres. At this time, fire crews expressed concerns about accessing the fire due to difficult and dangerous terrain. There was also no safety zones for crews anywhere remotely accessible to the fire due to the steep slope, dense forest and an abundance of snags from previous fires. High temperatures, coupled with low humidity created critical burning conditions, with unstable air favoring active fire behavior. The locally-known "Chetco Effect" also created gusty northeast winds (10-15 mph with gusts up to 25 mph) causing relative humidity to drop, warmer temperatures. As a result of the persistent winds and low relative humidity, fuels were drier and prone to ignition from flying embers. The fire made significant runs between August 19th to 28th, growing from 22,029 to 125,252 acres with the first mandatory evacuations taking place on August 19th. On October 5 the Pacific Northwest Type 1 Team 2 transferred command of the Chetco Bar Fire to a local Type 3 organization. The fire remains 191,197 acres and 98% contained with minimal fire behavior.

A. Describe Critical Values/Resources and Threats:

Summary of Issues:

Critical Value	Value-at-Risk	Drainage with Value	Risk	Threat Description
Human Life & Safety Property	Roads Motorized Access	EF Pistol R-Pistol R NF Pistol R-Pistol R SF Pistol R Boulder Creek (Outside Wilderness) Eagle Cr-Chetco R Nook Cr-Chetco R S.F. Chetco R EF Winchuck Upper NF Smith R	High High Low High Very High Very High Very High Very High Very Low	Post-fire watershed conditions threaten the life and safety of visitors using the Forest Service roads and road infrastructure within the fire perimeter. Roads are downslope of high/moderate severity burned areas increasing the risk from debris flows, increased runoff, and rill/gully erosion from over-steepened slopes during storm events. These events can plug culverts, erode roadbeds, and trap the public behind damaged areas. There is also an increased risk from burned, hazard trees, and rockfall, especially the hardwood danger trees along the 1376. A Wilderness Retreat resident has already been injured due to a falling tree along this stretch of road. The 137(is currently only open to authorized personnel due to safety concerns.
Human Life & Safety Property	Recreation Facilities	EF Pistol R-Pistol R Boulder Creek (Outside Wilderness) Nook Cr-Chetco R S.F. Chetco R EF Winchuck	Intermediate Low Very High Very High Very High	Campground and day use areas had portions of their facilities burned leavin hazards to the public from adjacent open roads even when sites are closed. Some sites will also be opened to public once the fire closure is lifted. Several CXT toilets vaults partially or completely burned creating hazards t users from adjacent open roads along the Chetco River and the risk of over flowing sewage into adjacent areas. Several hazard trees also occur at sites that will be opened in the first year. Gravel bars along the Chetco River receive high use over most of the year exposing users to increased flooding and debris flows with only one exit point at each location.
Human Life & Safety Property	Trails	EF Pistol R-Pistol R Sluice Cr-Chetco R (Outside Wilderness) Boulder Creek (Outside Wilderness) Kalmiopisis Wilderness	High Very High Very High High	Post-fire watershed conditions threaten the life and safety of visitors using the Forest Service trails within the fire perimeter. Trails are downslope of high/moderate severity burned areas increasing the risk from debris flows, increased runoff, and erosion from over-steepened slopes during storm events. These events can wash out the trail tread and damage other infrastructure.
Natural Resources	ESA Listed Fish (Theatened) SONC Coho Salmon (*Oncorhynchus kisutch*)	EF Pistol R-Pistol R NF Pistol R-Pistol R SF Pistol R Sluice Cr-Chetco R (Outside Wilderness) Boulder Creek (Outside Wilderness) Eagle Cr-Chetco R Nook Cr-Chetco R S.F. Chetco R Kalmiopisis Wilderness EF Winchuck Upper NF Smith R	Low Low Low Very High Very High Very High Very High Very High Very High High Low	Risk to coho salmon and designated critical habitat are likely to occur from post-fire runoff, debris flows, ash, and sediment delivery. Roads are also likely to be impacted from higher runoff and debris flows, scouring roadbed and increasing sedimentation to coho habitat. These threats have the potential to negatively affect populations deterring recovery objectives.

Natural Resources	ESA Listed Wildlife (Theatened) NSO (*Strix occidentalis caurina*) and MAMU (*Brachyramphus marmoratus*)	EF Pistol R-Pistol R NF Pistol R-Pistol R SF Pistol R Sluice Cr-Chetco R (Outside Wilderness) Boulder Creek (Outside Wilderness) Eagle Cr-Chetco R Nook Cr-Chetco R S.F. Chetco R EF Winchuck Upper NF Smith R	Intermediate Low Low Low Intermediate High Intermediate Intermediate Low Very Low	There is a risk to ESA listed habitat due to loss of ground productivity and vegetation recovery. There is Northern Spotted Owl (NSO) Critical Habitat located in moderate to high severity burn. Marbled Murrelet (MAMU) Critical Habitat is found in some low severity, mostly moderate and high severity. Risk to NSO and MAMU critical habitat may be affected by loss o overstory and mid-story canopy, as a result of the fire. Fire would have resulted in canopy cover loss in both high and moderate severity burned areas. Moderate soil burn severity may result in higher possibility for regeneration of vegetation. Only areas of high soil burn severity would resu in loss in soil and/or vegetation productivity and would have effects on regeneration of vegetation. NSO Prey species availability may have varying responses to soil burn severity. In areas of high soil burn severity, you may see a temporary loss of late seral prey species (i.e., northern flying squirrel). In areas of low to moderate soil burn severity, an increase in early seral prey species (i.e., deer mice) may be evident. There will be no change in MAMU prey species regardless of burn severity. Invasive species such as barred owls may increase in post-fire landscapes, increasing competition for both NRF (nesting/roosting/foraging) habitat for spotted owls.
Natural Resources	ESA Listed Plants (Threatened) Macdonald's rockcress (*Arabis macdonaldiana)*	Kalmiopisis Wilderness	Low	Plant occurs on a rocky moutain top in the wilderness which fire did not burn.
Natural Resources	Native or naturalized communities non-forested	EF Pistol R-Pistol R NF Pistol R-Pistol R SF Pistol R Sluice Cr-Chetco R (Outside Wilderness) Boulder Creek (Outside Wilderness) Eagle Cr-Chetco R Nook Cr-Chetco R S.F. Chetco R Kalmiopisis Wilderness EF Winchuck Upper NF Smith R	Very High Low Very High Low Very High Very High Very High Very High Very High Very High Low	Field reviews indicate that there is a substantial risk of noxious weed invasion along roads, handlines and dozerlines used during fire suppression activities. This threat is due to the liklihood that some noxious weed seeds were brought into the area by fire equipment and suppression activity within known noxious weed locations within the burn. The slow natural regeneration following moderate to high burn severity also leaves some areas at risk. Known noxious and invasive weed populations are expected tc aggressively compete with native species for space and nutrients in burned areas.

Natural Resources	Wild and Scenic River, and State Scenic Waterway - Chetco, Illinois, and Smith	Sluice Cr-Chetco R (Outside Wilderness) Boulder Creek (Outside Wilderness) Eagle Cr-Chetco R Nook Cr-Chetco R S.F. Chetco R Kalmiopisis Wilderness EF Winchuck Upper NF Smith R	Very High Very High Very High Very High Very High Very High Very High Low	Changes to water quality and instream conditions/habitat could impact fishing, fish watching, swimming or snorkeling in deep natural pools of clea and emerald water, tubing and rafting values for which river was designated
Cultural & Heritage Resources	Cultural Sites	EF Pistol R-Pistol R NF Pistol R-Pistol R SF Pistol R Boulder Creek (Outside Wilderness) Eagle Cr-Chetco R Nook Cr-Chetco R S.F. Chetco R Kalmiopisis Wilderness	Intermediate Low Low Intermediate Very High High Low Low	The fire removed protective vegetation and litter (camouflaging) that obscured artifacts at several cultural sites increasing risks to exposed features and artifacts. This could lead to collection and looting of these sensitive sites which would also result in irreversible loss. Sites have potential for downslope sheeting (soil erosion; sheet washing). Site continues to have contemporary use. Tree throws on site from big Douglas-firs are already causing disturbance up to 3-4' in depth and there is potential for more tree throws to occur.
Natural Resource	Soil productivity	EF Pistol R-Pistol R NF Pistol R-Pistol R SF Pistol R Sluice Cr-Chetco R (Outside Wilderness) Boulder Creek (Outside Wilderness) Eagle Cr-Chetco R Nook Cr-Chetco R S.F. Chetco R Kalmiopisis Wilderness EF Winchuck Upper NF Smith R	High High Low Very High High Very High Very High High Low Very High Intermediate	Risk of accelerated erosion and mass wasting is high because the forest canopy and effective ground cover have been denuded by moderate to high intensity fire across most of the subwatershed. The condition is compounde further by the steep and very steep slopes that are highly erosive, and a low to moderate degree of hydrophobicity in the surface soil horizons. Accelerated soil loss due to erosive forces could diminish productivity for decades.

B. Emergency Treatment Objectives:

The goal of the burned area emergency response is to:

- Reduce threats to personal injury and/or human life to users of roads in high and moderate severity burn areas on the Gold Beach Ranger District. Although the fire did burn over the district boundary into the Wild Rivers Ranger District, no roads were burned over or impacted by suppression activities. The following subwatershed have roads that rated as High/Very High risk for roads: Eagle Creek-Chetco River, Nook Creek-Chetco River, South Fork Chetco River, East Fork Winchuck, East Fork Pistol River, North Fork Pistol River and Boulder Creek.
- Threats to roads can be mitigated by installing rolling dips, overflow structures, culvert risers, energy disipators, and enlarging culverts that could plug.
- Reduce threats to personal injury and/or human life by installing warning signs and road storm patrols.
- Control expected invasion of noxious weeds within the area, especially along and adjacent to Forest roads and dozer lines used by fire equipment and in existing populations within the Chetco Bar fire boundary.
- Reduce potential vandalism, theft and damage to cultural sites by seeding with local native seeds to obscure artificats until natural vegetative reestablishes itself. Installation of erosion abatement (coconut fiber wattles), closure gates and resource monitoring will also be utilized to prevent potential vandalism.
- Identify appropriate monitoring activities that estimate the effectiveness of emergency stabilization treatments and identify necessary maintenance and continuation of other approved BAER activities.

Objective:

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

Land **80** % Channel **70** % Roads/Trails **70** % Protection/Safety **85** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land (Noxious Weeds)	70	80	80
Land (Cultural Protection)	85	85	85
Channel (none proposed)	--	--	--
Roads (Drainage and Erosion Control)	70	85	85
Protection/Safety (Hazard Trees)	100	100	100
Protection/Safety (Road Warning Signs)	100	100	100
Protection/Safety (Drainage and Erosion Control)	70	85	85

E. Cost of No-Action (Including Loss): Refer to Values at Risk (VAR) spreadsheet for specific information

The VAR analysis summary identified that the total treatment cost is estimated at $2,430,437 with an expected benefit of $78,348,150. The summary implied minimum value of protecting non-market resource critical values is justified for the treatments proposed in this BAER assessment. The expected benefit/cost ratio was 32.2.

F. Cost of Selected Alternative (Including Loss): Refer to (VAR) spreadsheet for specific information.

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: **John Chatel, Pacific Northwest TES Program Manager**

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Team Members:
BAER Team Leader: John Chatel, R6 Regional Office
Team Leader (t): Barbara Garcia, R6 Regional Office
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Hydrology: Dave Callery, R1 Regional Office
Hydrology: Mark Dallon, Sawtooth NF
Hydrology: Spencer Higgins, National Weather Service
Hydrology (t): Hazel Owens, Malheur NF
Engineering: Otis Blankenship, Rogue River Siskiyou NF
Engineering: Shawn Robnett, Sawtooth NF
Engineering: Kevin Duchow, Sawtooth NF
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GIS: Chris Strobl Chief Information Office Moab, UT
PIO: Skye Siebel, AD
Recreation: Eric Amstad, Malheur NF
Botany: Clint Emerson, Rogue River Siskiyou NF
Botany: Kailey Clarno, Rogue River Siskiyou NF
Wildlife: Rachel Vaughn, Rogue River Siskiyou NF

H. Treatment Narrative:

Land Treatments:

Cultural Treatments - Chetco River Native American Site

Purpose of Treatment: The application of native grass seed across the entirety of the landform is needed to increase ground cover so artifacts at the site are hidden and protected from theft.
General Description: Reestablish ground cover vegetation to abate erosion and discourage looting on site. Aerial mulching of the site landform was proposed but considered cost prohibitive and likely to introduce invasive species. As such, the application of native grass seed across the entirety of the landform is a preferred cost-effective means to achieve desired post-fire conditions on site.
Location (Suitable) Sites: This 5 acre site is situated on a high terrace above the Chetco River. Exact location is senstive and protected cultural information.
Design/Construction Specification(s): Native grass seed, approved by Rogue-Siskiyou National Forest resource managers, will be sown by hand as soon as it can be accomplished post-fire. An additional round of seeding will take place in the spring of 2018. The Rogue-Siskiyou recommends native grass be

spread at 25 lbs. per acre. Two days are allotted for two separate treatments (Fall 2017 and Fall 2018) by two GS-7 archaeological technicians and one GS-11 archaeologist.

Cultural Treatments - Mount Emily Native American Site

Purpose of Treatment: Maintaining the integrity and feeling of the site post-fire is of the utmost importance in order that it retains its character for traditional use by contemporary Indigenous groups. In order to abate the downslope movement of colluvium from the denuded hillslope above onto the site, three tiers of coconut fiber wattles will be installed 30, 60, and 90 meters upslope from the site features.

General Description: Abate sheet erosion potential from upslope of site in order to prevent information loss and damage/displacement of site features and artifacts through the use of biodegradable coconut wattles. Maintain integrity and feeling of the site post-fire in order to retain character for traditional use by contemporary Indigenous groups. Monitor treatment effectiveness.

Location (Suitable) Sites: The site is situated on Mount Emily. Exact location is senstive and protected cultural information.

Design/Construction Specification(s): Three tiers of coconut fiber wattles will be installed 30, 60, and 90 meters upslope from the site features (Figure 16). Each tier will comprise 200 feet of wattle, and will be aligned in the form of a chevron with its apex point at the center of the slope above the site landform. 100 feet of wattle on either side of the apex will be angled downslope in such a way that colluvial sedimentation will be directed off the two sides of the slope above the site landform, effectively preventing colluvial sediments from entering into the site area. In order for this treatment to be effective, it is important that the wattles be well anchored and held fast to the ground surface throughout their total length of 600 feet. Two days are allotted for treatment construction for Archaeologist, hydrologist, and two archaeological technicians.

Noxious Weeds EDRR

Purpose of Treatment: To respond to the potential for rapid invasion of invasive plants into native plant communities on the Rogue River-Siskiyou National Forest. EDRR is prescribed in order to mitigate long term impacts to native plant communities within and in the vicinity of the fires boundaries. The purpose of treatments is to promote native plant resources by removing invasive plant populations.

General Description:

- Invasive plant detection surveys – Known infestations of high priority invasive plants within high and moderate burn severity in the Chetco Bar Fire area will be assessed for potential spread or expansion. When assessment actions are initiated, personnel will be equipped to immediately treat infestations. This will allow for the best chance of managing known infestations to prevent an expansion from pre-fire levels. Additionally, detection surveys will be focused in areas of increased probability of infestation (e.g. Roads, trails, fire lines, drop points, helispots, staging areas, safety zones, areas of high and moderate burn severity within a half- mile of known invasive plant infestations, and BAER implementation impacts). BAER funding authorization will be used for the first year (starting October 2017) to meet objectives above. Existing or future partnerships may be used to monitor and/or treat invasive plants on National Forest System Lands.
- Treatment of known invasive plant sites and new sites detected through surveys – Objective is to strategically treat known infestations (currently estimated to be roughly 80 acres). Strategic treatments include sites adjacent to moderate and high severity burned areas, fire lines, meadows (Long Ridge, Low Meadow, High Prairie, Mislatnah Prairies, Red Mountain Prairie, and Windy Valley), Wheeler Creek Research Natural Area, endemic and sensitive plant populations, and native plant communities associated with the Snow Camp Botanical Area. High priority invasive plant infestations in sensitive areas that burned at low severity will also be treated.
- Effectiveness monitoring of treatments will determine if follow-up treatments or other methods are needed or feasible within the same year.

Location (Suitable) Sites: Known and expected invasive plant sites within and directly adjacent to the Chetco Bar Fire area on National Forest System Lands. Proposed locations for surveys are along vector

corridors and within high and moderate severity burned areas within the Chetco Bar Fire. Existing known invasive plant locations are included in the accompanying map and will be treated in a strategic manner. New sites found during EDRR surveys will be treated to the extent possible with priority given to sites within or near to fire lines, meadows, and sensitive plant sites, the Snow Camp Botanical Area, Kalmiopsis Wilderness and Wheeler Creek Research Natural Area. See the map that accompanies this proposal for more specific location information.

Design/Construction Specifications: Detection surveys entail hiking or driving vector corridors and hiking areas of high and moderate burn severity. Survey protocols include GPS mapping, flagging, and documenting occurrences. Treatments include manual removal.

Channel Treatments: No Treatments Proposed

Roads and Trails Treatments:

Roads

Road Drainage Stabilization

Purpose of Treatment: The watersheds burned in the Chetco Bar Fire will show the effects of the fire via increased runoff rates, erosion, sediment, and debris transport creating a future concern for roads and associated drainage structures. The effects could result in filling the ditches, plugged culverts and potentially overtopped or washed away road surfaces and fill slopes. Treatments are recommended to minimize the risks to public safety and protect the investment of the transportation system from the expected increased post-fire runoff.

General Description: Several road stabilization treatments have been prescribed for Forest Service Roads within the Chetco Bar Fire that will be directly impacted by post fire events. These treatments are necessary to mitigate the predicted effects that will occur to the transportation infrastructure system.

Location (Suitable) Sites: All roads within the fire perimeter are to some degree going to be affected by the effects of the fire. The most important roads to focus on will be:
3680360, 1407000, 1407210, 1407211, 1407212, 1909000, 1909200, 1909202, 1909220, 1909222, 1407150, 1407180, 1407900, 1376310, 1376311, 1376312, 1376313, 1376314, 1376315, 1376316, 1376317, 1376318, 1376319, 1107620, 1909050, 1107570, 1107571, 1107572, 1107573, 1107574, 1107575, 1107576, 1107577, 1107550, 1107551, 1107552, 1107553, 1107554 1983000

Design/Construction Specifications:

- Increase Ditchline Capacity – Where increased overland flows are expected due to post-fire effects and have the potential to overwhelm current ditches, ditchlines will have capacity increased through removal of soil, rock, and organic material. Excess material will be either hauled away or side cast such that the material cannot reenter the drainage structure during a runoff event.
- Increase Culvert Cross-Drain and Catchment Basin Capacity– Where increased overland flows and ditchline flows are expected due to post-fire effects and have the potential to overwhelm catchment basins and cross-drain culverts, increase drainage capacity by removing any blockages from inlet, outlet and inside barrel and straighten bent inlets and outlets. Remove soil, rock, and organic material at catchment-basins to between 6 inches and 12 inches below the bottom of the culvert. Hauled away or side cast the material so that it cannot reenter the drainage structure during a runoff event. Culverts are typically 18 inch to 24 inch ditch relief culverts, with some larger but are easily accessible by equipment, i.e. backhoe. Individual culverts that are larger or have larger fill above the culverts that are not easily accessed with equipment and will need to have material removed by hand are counted on an individual basis.
- Carsonite Installation - Install a single white carsonite post with green retroreflective tape to identify the location of the inlet during storm patrols.

- Rolling Drain Dips (with or without armor) – Construct rolling dips per Forest Service standards. Place rip rap across the roadway and on the fill slopes where runoff leaves the roadway. These should only be used where there is a bench or fairly large flat location to drain the runoff away from the road. In this steep country, a little runoff down an unprotected slope erodes material quickly.
- Down spouts – Repair and replace all damaged down spouts that are or were connected to culvert outlets. Use the proper culvert bands (hugger not dipple) to connect the downspout to the existing culverts where appropriate. The other method of connecting down spouts to culverts is to drill and bolt the down spout to the culvert. This is also an approved method and allows for access to clean the culvert outlet and down spout if necessary.

Culvert Inlet Protection

Purpose of Treatment: The Chetco Bar Fire has left a large amount of loose woody debris in the drainages that is anticipated to move down the drainages until it encounters a roadway crossing. Left unprotected, the culvert inlets will become clogged with woody debris, not be able to pass water and eventually could fail. These treatments capture or move the woody debris away from the culvert inlets to allow continued access for the water to the culvert.

General Description: Culverts primarily fail due to debris plugging up the culvert inlet. Debris deflectors, debris racks and culvert "Tee" risers are methods that allow for water flow through and around woody debris that washes down the drainage. Debris racks capture the woody debris upstream away from the culvert and deflectors would move the debris to sides, away from the culvert inlet. The culvert risers move the culvert inlet vertically allowing for debris and sediment to fill in the catch basin around the culvert inlet. Each treatment has its own advantages and should be used in the appropriate locations for maximum effectiveness.

Location (Suitable) Sites: The roads within the Chetco Bar Fire are placed on very steep hillsides. The steepness of the hillsides and associated drainages tend to increase the amount of woody debris and rocks that fall down and end up at culverts. The steepness also leads toward large through fill road sections. These conditions lead to needing to protect the culverts' inlets. Locations for treatments include:

1376000 – From MP 0.0 to 7.9 (Paved section) - 4 Debris Deflectors, 8 Culvert Risers, 3 Debris Racks
1376000 – From MP 7.9 to 12.3 (between 2nd and 3rd Bridges) – 4 Debris Deflectors, and 1 Culvert Riser
1376000 – From MP 12.3 to 21.17 - 8 Debris Deflectors
1917000 – From MP 0.0 to 3.05 – 7 Debris Deflectors
1983000 – From MP 1.5 (FSR 1983030) to 6.62 (FSR1983130) – 7 Debris Deflectors
1909000 – From MP 0.0 to 5.0 – 5 Debris Deflectors

Design/Construction Specifications:

- Debris (Trash) Racks - Assemble wood or steel culvert inlet debris racks where indicated or found to be necessary above culvert locations. Debris racks design shall be such that it will capture the expected woody debris material that will come with the expected flows in each of the drainages. The debris rack needs to be designed to stop small to medium floating debris. The storage area must be large enough to retain the anticipated type and quantity of debris expected between cleanouts. The length of the structure should be of such length that would prevent debris from coming around the structure and getting between the inlet of the culvert and the rack. Debris racks should be located approximately twice the culvert diameter, upstream of the culvert inlet. This will allow enough room for water to find its way back to the culvert inlet if the rack becomes full and is still close enough for cleaning. 2/3 of culvert diameter is a typical spacing for vertical members of the debris rack. The height of the debris rack is dependent on the height of the anticipated flow plus a few feet for freeboard and to catch the woody debris that is floating on top of the water.
- Debris Deflectors – Assemble wood or steel culvert inlet debris deflectors where woody debris is anticipated to come down the drainage. Debris deflectors shall be designed to catch and move woody debris to the sides of the culverts, keeping the channel open for flow to pass through the culvert. Debris deflectors shall be designed to be installed quickly and efficiently. The deflector is a triangle shape with

the wide part being over the inlet of the culvert and the point facing up the drainage. The height of the deflectors should allow some freeboard above the expected depth of flow in the upstream channel for the design flood. Vertical racks should be driven into the ground similar to pile driving. Depth of bury for the three corner members should be 1/3 of the height of the debris rack. The debris rack height should be a minimum of 6 inches higher than the culvert.

- Culvert Risers – Culvert risers allow for continued low flow conditions while also accounting for the potential of debris, rocks, and sediment to come down the drainage and plug up the inlet of the culvert. The riser portion is a "T" that is inverted so that the middle leg is pointing up, away from the ground. Depending on how much debris, rocks, and sediment is anticipated, an additional riser pipe can be attached to the leg to create an "inlet" that can go vertical. Creating notches in the vertical pipe to allow water to flow into the vertical pipe and out the culvert is good practice so that there isn't ponding against the fill slope. Culvert risers should be used when certain criteria exist, large through fill sections of road, limited access to the culvert with heavy equipment, loss of access during storm patrols could put people in an unsafe situation, and there is potential for sediment transport in the drainage.

Refer to Figure 81, 82, and 91 on pages 131, 132, and 144, respectively, of the *Burned Area Emergency Response Treatments Catalog* for examples of debris racks, debris deflectors, and culvert risers design.

Culvert Installation and Upsizing

Purpose of Treatment: The effects of the Chetco Bar Fire are anticipated to increase the runoff from the winter rains, impacting some roadway drainage crossings. This treatment will increase the capacity of the crossings through either larger culverts or relief culverts at these crossings. The treatments identify roads and culverts that are predicted to be impacted by the increased post fire flows and where necessary, recommends treatments to minimize the risks to public safety and protect the investment of the transportation system.

General Description: The effects of the Chetco Bar Fire are anticipated to increase the runoff from the winter rains. In order to accommodate the increase in runoff, the capacity of some crossings must be increased.

Location (Suitable) Sites: The maintenance level 3 and 4 roads are a higher standard road that tend to start at the bottom of the drainage and end near the top of the ridges. These roads and drainages were identified as being undersized and has the highest consequences if they failed. Not all roads were seen during this assessment, so if large fills are encountered during the implementation, relief culvert locations should be identified and installed. Known Locations for Treatments:

- Second Creek on 1376000 (MP 5.95) – upsize the current culvert (6 foot) to accommodate the calculated post fire flow of roughly 500 cfs (5' x 15' arch) (see the Hydrology report); check with fisheries as this is a fish bearing stream.
- 1909000 (MP 2.17) – upsize the existing culvert (5 feet) to accommodate the calculated post fire flow of roughly 428 cfs (96" culvert).
- 1909000 (MP 3.16) – upsize the existing culvert (5 feet) to accommodate the calculated post fire flow of roughly 428 cfs (96" culvert).
- 1983000 (MP 3.49) – upsize the existing culvert (2 feet) to accommodate the post fire flow of roughly 66 cfs (60" culvert).
- Four 24" relief culverts, including locations at 1376000 (MP 5.95), and 1909000 (MP 3.33).

Design/Construction Specifications: Culvert Replacement – where culverts will be severely impacted by post-fire runoff, remove and replace with culvert sized for post-fire flows. Where appropriate design as an AOP. Relief Culvert Installation - where culvert replacement is not cost-effective add a relief culvert higher in the road fill to increase the total crossing capacity, estimated overflows from post-fire runoff. Adding a relief culvert higher in the road fill will also require a downspout at the outlet to ensure that the flow is not eroding the fill slope of the road.

Burnout Cavities Under Forest System Roads and Shoulders

Purpose of Treatment: These treatments are necessary to mitigate the predicted effects of collapse/failure that will occur to the roadbed from increased runoff down the roads, and the impact to safe vehicular travel.

General Description: Voids created under the roadway that were a result of woody debris & stumps burning in road and shoulder. Water from high and moderate severity burned slopes could run into the voids further eroding road fills. Implement road and shoulder fill repairs where travel way structural integrity is compromised.
Location (Suitable) Sites: Void locations identified during field assessments that pose a hazard and have high potential for failure include:
FSR 1376 MP 3.38 and 3.53, both under a paved road segment and extend out into roadway.
FSR 1376080 MP 0.005, access road into Nook Bar Campground.
FSR 1909, two locations identified in the high intensity burn area.
FSR 1983 MP 10.7, stump burnout in road shoulder.
Design/Construction Specifications: Burnout sites to be excavated and woody debris remnants removed. Place suitable backfill in lifts and compact; surface is then restored with aggregate or hot mix asphalt, depending on pre-existing surface type.

Hazard Tree Falling at Road Treatment Locations
Purpose of Treatment: The threat of hazard trees falling at road treatment locations during treatment implementation and harming work crews. Those trees discovered to be hazardous will be mitigated as the work is implemented in the area.

General Description: Locations on Forest Service roads within the Chetco Fire where emergency road treatments are approved to be implemented, and contain burnt dead and dying trees that are determined to be an immenent hazard to workers. Those trees would be felled before road treatment work begins to provide a safe work environment for treatment implementation.
Location (Suitable) Sites: All sites identified for emergency road treatments where crews would be congregating and working at length in one location, including drainage stabilization, culvert inlet protection, culvert installation and upsizing, burnout cavities under roads and shoulders, and where storm patrols must work to deal with issues such as plugging culverts.
Design/Construction Specification(s):

- FS personnel will prepare and administer the contract. Hazard trees should identified by a qualified individual.
- Assuming one hazard tree for every culvert that needs to be cleaned by hand, 330 for the entire fire and a felling crew can cover 4.5 miles of removing hazard trees per day if they are only at individual locations. It would take the felling crew 22 days to cover the road locations intended to be treated.

Gate Closures
Purpose of Treatment: The primary reason of installing the gates is for public safety especially during periods of expected moderate to high rainfall events. In the event severe stormy weather passes over the Chetco Bar Fire area a line officer may decide they need to close the roads that would be affected by the expected run off. A gate would be necessary in preventing the public from accessing the area of the forest by vehicle during these severe weather events. The closure orders will be necessary when it is determined there is a danger to the public caused by potential debris flows and flooding from the hill slopes above the roads.
General Description: This treatment is for the installation of steel post gates to close roads when necessary for public safety and to develop and implement closure orders when necessary.
Location (Suitable) Sites:

Road	Location
FSR 3680360	Just off the intersection with FSR 3680000
FSR 1983110	As close to the intersection with FSR 1983000 as practical
FSR 1107550	At the intersection with FSR 1107000
FSR 1107570	At the intersection with FSR 1107000
FSR 1376310	At the intersection with FSR 1376310

FSR 1407150	At the Forest Boundary between section 36 and 19
FSR 1407900	At the intersection with FSR 11407000

Design/Construction Specification(s):

The gates shall be constructed according to the *Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03* (Similar to the photo below). All signing associated with the gate installation shall follow Forest Service Engineering Manual 7100-15 and the Federal Highways Manual Of Uniform Traffic Control Devices (MUTCD). This includes typical gate barricade markers and object markers and any signs that may be installed with the gate such as a road closed sign. All gates shall be able to be secured in the open position so as not to be a hazard to traffic. Cables, chains, or single-wire barriers shall never be used across any roadway because they are not readily visible to road users. Travel management signs may be used on gates to display access and travel management restrictions and closures. Refer to the Sign Installation Guide for additional information about the required gate signs. Road closure information will be posted on the gates and through public notices.

Road Storm Patrols

Purpose of Treatment: Storm patrols are used to identify those problems such as debris caught on the debris racks, plugged or partially plugged culverts, and washed out roads and to clear, clean, and/or block those roads that are or have received damage. The storm patrollers shall have access to at least a backhoe and dump truck that can be used when a drainage culvert is plugged or soon to be plugged and to repair any road receiving severe surface erosion. Forest personnel will survey the roads within the fire perimeter after storms during the rainy season. Survey will inspect road surface condition, ditch erosion or capacity issues, debris racks, and culverts/inlet basins for capacity to accommodate runoff flows. A plan very similar to a FERM (Flood Emergency Road Maintenance) plan should be drafted. The plan identifies the responsibilities of those prior to, during and post large flow events.

General Description: Roads within the Chetco Bar Fire contain drainage structures that cross drainages and side channels located in watersheds that have areas of a large percentage of high burn severity. These side channels now have the potential for increased runoff and debris flows. The predicted increased flows are a direct cause from the lack of vegetation to slow down the water flow and/or from hydrophobic soil conditions that can prevent surface water infiltration. These flow increases pose a threat to the existing crossings which may result in plugging culverts or exceeding their maximum flow capacity. If these flows plug drainage structures, the result could be massive erosion and debris torrents further down the drainage due to the failure of the fill slope. Also, there is an immediate and future threat to travelers along these roads within the burned area due to the increased potential for rolling and falling rock and trees from burned slopes and increased potential for debris flows. With the loss of vegetation normal storm frequencies and magnitudes can more easily initiate rill and gully erosion on the slopes and it is likely that this runoff will cover the roads or cause washouts. These events make for hazardous access along steep slopes and put the safety of users at risk.

Location (Suitable) Sites: The patrols should first focus on the Forest Service roads that receive the most traffic and are of more value to the transportation system. The Forest and district have identified the most susceptible areas and roads across the district and those locations that are within the fire perimeter are listed below:

- 1376000 – from Loeb Park to the junction with the 1917000 (access to residences)
- 1107000 – from the end of the County Road to MP 1.5 (access to residences)
- 1107000 – near Donley's Road
- 1407150
- 1376000 – MP 0.4 (shoulder scour)
- 1983000
- 1909000
- 3680360
- 1205000

Design/Construction Specifications:

1. FS personnel will direct the work.
2. Immediately upon receiving heavy rain the FS will send out patrols to identify road hazard conditions – obstructions such as rocks, sediment, washouts – and plugged culverts so the problems can be corrected before they worsen or jeopardize motor vehicle users.
3. Heavy equipment necessary to mechanically remove any obstructions from the roads and culvert inlets and catch basins shall be procured when needed.
4. All excess material and debris removed from the drainage system shall be placed outside of bank-full channel where it cannot re-enter stream channels.

Trails

Trail Stabilization

Purpose of Treatment: The purpose of the trail stabilization treatments is to allow water to (1) sheet flow across the trail, and (2) where water does collect, to shed off the trail as soon as possible. Water is a trail's worst enemy, and the trail treatments are intended to minimize the time and distance that water spends on the trail sections impacted by moderate to high severity burn by building features into the trail that shed the water. Where water flow over the trail cannot be avoided, armoring the trail will stabilize it and stop or slow down erosion. By doing these treatments, the trail prism will be protected from the increased hydrological response that is expected for post-fire storm events.

General Description:Trail stabilization work: Install drainage (Rolling Grade Dips/Grade reversals/Nicks) features where needed in moderate to high severity burn areas to stabilize trail. Install waterbars only where necessary and then use only rock. Clean out existing waterbars. Armor drainage crossings. Re-establish trail bench/prism as needed. Remove hazard trees, where needed, for worker safety.

Location (Suitable) Sites: Sections of the following trails that have been impacted by moderate to high burn severity (locations identified on treatments map). Approximately 18.5 miles out of 48.4 miles of trail within the burn perimeter were impacted by moderate to high severity burn.

Snow Camp trail #1103	Chetco Divide trail #1210	Kalmiopsis Rim trail #1124
Panther Lake trail #1104	Red Mountain trail #1105	
Tincup trail #1117	Navy Monument trail #1105A	
Boulder Tie trail #1117B	Bombing Site trail #1118	
Tincup Creek trail #1117C	S Bend Mt trail #1189	
Mislatnah trail #1119	Little Chetco trail #1121	
Upper Chetco trail #1102	Bailey Mt trail #1109	
Gardner Mine trail #1122	Bailey Cabin trail #1131	
Johnson Butte trail #1110	Emily Cabin trail #1129	

Design/Construction Specification(s): If contracted out, line out work with agency trail expert. Deberm trails where needed, re-establish 5% outslope, install knicks, and rolling grade dips; minimize waterbar use where grade reversal methods can be used. If waterbars must be used, use only rock. Clean out existing waterbars or replace with grade reversal methods. Armor drainage crossings where needed. Remove hazard trees, as needed, for worker safety.

Implementation Team:

Implementation Team – Implementation Team Leader in charge of insuring work gets completed in a timely manner to reduce risks to BAER values, as well as costs for CORs needed to administer contracts.

Treatment	Units	# of Units	Unit Cost	Total Cost
Implementation Team	Days	60	$600	$36,000

Protection/Safety Treatments:

Roads

Hazard Warning and Closure Signs for Roads

Purpose of Treatment: An initial request was authorized for $10,000 for area closure and warning signs. This request is for an additional $2,300 to cover the rest of the cost. The purpose of "Burned Area Warning Signs" is to reduce the risks to human life and safety by alerting motorists of existing threats while traveling the authorized routes within the areas susceptible to flooding, debris flows, hazards trees, and all other risks attributable to post fire events on the landscape. Replacement of the burned Regulatory and Warning signs is necessary at intersections and bridge approach ends to identify potential hazards, thus conforming to the FS Sign and Poster Guidelines and MUTCD. Replacement of the pre-existing route and roadside hazard markers burned or melted by fire are for safety, as stipulated in the Forest Travel Management Plan and the Motor Vehicle Use Map.

General Description: This treatment is for installation of "Entering Burned Area" warning signs and replacement of burnt or fire damaged warning signs, roadside hazard markers, and route markers.

Location (Suitable) Sites: Locations for "Burned Area" warning signs will be located at all points of entries by use of forest system roads into the burned areas. These locations are as follows:

- On FSR 1107000, just prior to the east intersection with FSR 1205000
- On FSR 1205000, at the intersection with FSR 1106000, Eastbound.
- On FSR 1376000, just prior to the burn area going up the Chetco River.
- On FSR 1376010, at the Forest Boundary.
- On FSR 1407000, at the Forest Boundary.
- On FSR 3680000, just prior to the intersection with FSR 3680360.
- On FSR 1376000, just north of the intersection with FSR 1407000, Southbound.
- On FSR 1376000, at the intersection with FSR 1909000, Northbound.

Locations of Warning and Regulatory signs damaged by fire:

- FSR 1376080, Nook Bar CG Stop sign and post
- FSR 1376100, Little Redwood Bar CG Stop sign and post
- FSR 1376110, Redwood Bar CG Stop sign and post
- FSR 1376000 MP 7.94 and 7.98, bridge end object markers (4)
- FSR 1376000 MP 12.24 and 12.42, One Lane Bridge signs and posts (2)

Locations of Route Markers and Hazard Identifiers:

- FSR 1983 HRM & 1983110 VRM and post
- FSR 1376, MP 8.80 to 11.20, Hazard markers
- FSR 1983, MP 4.25 to 8.20, Hazard markers

Design/Construction Specification(s): "Burned Area" warning signs along the roads shall measure, at a minimum, 48 inch by 30 inch and consist of 0.080" aluminum substrate, sheeted in high intensity yellow with black letters, which is shown in the photo below. The "BURNED AREA" sign lettering shall be a minimum of 5 inches in height. All signs shall conform to the M.U.T.C.D. standards and shall be installed per Federal Highway Safety Standards.

Hazard Tree Falling on FSR 1376

Purpose of Treatment: FSR 1376 (North Bank Chetco Road) is a heavily used Maintenance Level 4 paved road. The road accesses permanent residences in a private inholding neighborhood called Wilderness Retreat, as well as a private business above the South Fork Chetco bridge. Residents of Wilderness Retreat use this road daily for commuting to and from Brookings, OR. It is the only ingress/egress for these homeowners/business owner during the winter months. The roadway is lined with fire-killed alder, bigleaf maple and tanoak, with many of these trees leaning over and hanging directly over the roadway. These trees, especially alder, are very prone to failure, and all of these hardwoods are classified as imminent danger trees according to the Field Guide for Danger Tree Identification along Forest Roads and Work Sites in Oregon and Washington (2016). There is a need to mitigate the imminent hazard trees that pose a threat to public safety from being struck by falling trees, or having critical access blocked or delayed.

General Description: Imminent hazard trees within 50 feet either side of FSR 1376 would be mechanically felled along 3 miles of the most high risk section of road for public safety (minimize risk of falling trees in road, and maintain the only winter ingress/egress for permanent residents).
Location (Suitable) Sites: FSR 1376 along an approximate 3 mile length from western edge of fire up to the South Fork Chetco confluence/bridge.
Design/Construction Specification(s):

- FS personnel will prepare and administer the contract. Hazard trees would be identified by a qualified individual.
- Treat imminent hazard trees within 50 feet either side of road along approximately 3 miles of road; only cut trees that are determined would be likely to strike the roads, based on lean, etc.
- Due to safety issues with handfelling leaning, fire-killed hardwoods, felling would be primarily completed using mechanized equipment (Ponsee).
- Hand felling crew would be utilized where safe to do so and in support of the mechanized equipment.
- Utilizing this combination of equipment/crews will be faster, safer, and cause less delay in traffic flow along the road during the operation, than a solely hand-felling operation.
- Mechanized equipment must be rubber-tired to minimize damage to the pavement on FSR 1376.
- Additional funds will be needed from another source to pay for slash clean up (cost of excavator, additional time for the harvester for limbing and bucking, additional time for hand crew)

Bridge Approach Guardrail Replacement

Purpose of Treatment: The replacement of the fire damaged guardrail system is necessary to maintain a safety barrier for motorists at the bridge approaches, as per FHWA safety feature standards.
General Description: Guardrail support posts were burned through and railing was distorted from heat.
Location (Suitable) Sites: Three of four bridge approach railing barriers were compromised on the North and South approaches to the bridge over the South Fork Chetco River, on FSR 1376, mile post 7.99. They include the NW, NE and SW post and railings.
Design/Construction Specifications: Rail and post barriers to be installed as per FHWA W-Beam Guardrail Installation Specifications and the FP-14.

Recreation

Hazard Tree Falling for Recreation Sites

Purpose of Treatment: There is a threat of hazardous snags falling at locations where people congregate, such as trailheads and campgrounds.

General Description: Burned trees may pose an unacceptable risk to public safety or property. Hazard trees will be mitigated in locations needed to protect life, safety, and property.
Location (Suitable) Sites:

- Tincup trailhead
- Upper Chetco trailhead
- Chetco Divide/Vulcan Peak trailhead
- Bomb Site trailhead
- Nook Bar campground
- Redwood Bar campground
- Little Redwood campground
- Packers Cabin

Design/Construction Specification(s):

- Take down all hazard trees identified to be a threat to property such as toilet buildings. Take down hazard trees identified to be a threat to human life or safety at sites where there is no threat to property, but there is threat to human life or safety, [and where it is impractical to close the site to the public, or where it is necessary for worker safety while they are performing other BAER emergency work].

- Place trees on contour (where possible) in locations that do not adversely affect road drainage.
- Review hazards of felling trees/JHA before implementation.

Gate Installation

Purpose of Treatment: With the aftermath of the Chetco Bar Fire, comes increased hydrological response. The Chetco River is already known for extremely rapid rises in water levels. This water level rise will potentially be greatly increased post fire. To protect the public from flash flooding, gates will be installed to allow for periodic or seasonal safety closures.

General Description: Gates will be installed at Recreation Sites to allow for closures to protect the public from post-fire hazards. Closures may be implemented immediately until post-fire hazards are mitigated, and seasonally, or periodically on a temporary basis as the need arises to protect the public from rapidly rising river levels.

Location (Suitable) Sites:

- Miller Bar campground
- Nook Bar campground
- Redwood Bar campground
- Upper South Fork campground
- Lower South Fork campground
- Packers Cabin

Design/Construction Specification(s): Install heavy gauge Powder River stock gates at the entrances to the above recreation sites

Vault Pumping & Hazmat Cleanup

Purpose of Treatment: Raw sewage is a hazard to human life and safety, and to the environment. Perform work as soon as possible, as vaults have completely filled with rain water, and any further precipitation run-off could overflow the vaults, spilling out raw sewage.

General Description: Pump toilet vaults at locations where the vault openings have been compromised by the fire. Clean up debris at burned toilet buildings, crush vaults and backfill with appropriate material.

Location (Suitable) Sites:

- Upper Chetco trailhead
- Redwood Bar campground (2 vaults, 2 buildings)
- Little Redwood campground (2 vaults, 1 building)
- Packers Cabin

Design/Construction Specifications:

- Pump toilet vaults at locations where the vault openings have been compromised by the fire (see above list).
- Properly dispose of waste at nearest county or municipal dumping site.
- Plan routes to minimize mileage charges, and to keep number of trips to a minimum.
- Cover exposed vault holes at Redwood Bar and Little Redwood. Cover gray water vault at Little Redwood.

Hazard Warning for Trails

Purpose of Treatment: The public needs to be made aware of the hazards associated with post-fire events, such as falling objects, hazard trees (especially during wind events), mud slides and rolling rocks (especially during heavy rain events), and potential for flooding (especially during heavy rain events). These hazard warning signs will inform the public, increase safety, and transfer responsibility of post-fire effects safety to the public.

General Description: Install hazard warning sign at recreation sites to inform the public of the hazards associated with post-fire events, such as falling objects, hazard trees (especially during wind events), mud slides and rolling rocks (especially during heavy rain events), and potential for flooding (especially during heavy rain events).

Location (Suitable) Sites:

Snow Camp N/Fairview Meadow TH	Bomb Site TH	Persoll Peak Lookout TH
Snow Camp S TH	Chetco Gorge TH	Kalmiopsis Rim/Chetco Pass TH
Snow Camp Lookout TH	Nook Bar campground	N Kalmiopsis Rim TH
Panther Lake TH	Redwood Bar campground	Kalmiopsis Rim/Onion Pass TH
Tincup TH	Little Redwood campground	Babyfoot Lake TH
Upper Chetco TH	Upper S Fork campground	Canyon Creek TH
Vulcan Lk / Johnson Butte TH	Lower S Fork campground	Buckskin Peak TH
Chetco Divide/Vulcan Peak TH	Packers Cabin	Miller Bar campground
Red Mountain TH	Snow Camp Lookout	

Design/Construction Specification(s):

- Install hazard warning sign at each of the above listed recreation sites
- Sink a U-channel post or Square tube post at the entrances to the listed sites. Place in conspicuous locations.
- Mount 36" X 24" Polyflex or Aluminum signs (with pre-drilled holes) to U-channel or Square tube posts. Use fender washers if necessary, to prevent bolt head from pulling through sign during high wind events.

Monitoring Narrative:

No monitoring proposed other than treatment effectiveness monitoring.

Interagency Coordination:

On going interagency coordination for the Chetco Bar Fire is considered essential for keeping city, county, state, and other agencies informed and relaying the BAER assessment findings and continued communication regarding changed conditions and BAER implementation.

Treatment	Units	Unit Cost	# of Units	Total Cost
Interagency Coordination	Days	$400	20	$8,000

Part VI – Emergency Stabilization Treatments and Source of Funds **Interim # 1**

Line Items	Units	Unit Cost	NFS Lands # of Units	BAER $	Other $
A. Land Treatments					
Cultural Resource Site Protection	Each	$ 8,056	2	$16,111	$0
Invasive Species Treatments	Acres	$ 10	12,980	$133,564	$0
Subtotal Land Treatments				$149,675	$0
B. Channel Treatments					
Insert new items above this line!				$0	$0
Subtotal Channel Treat.				$0	$0
C. Road and Trails					
Trail Drainage Treatments	Miles	$ 8,470	18.5	$156,700	$0
Road Drainage Stabilization	Miles	$ 2,160	136.3	$294,408	$0
Road Inlet Protection	Each	$ 1,891	47	$88,890	$0
Road Culvert Upsizing and Relief Pipes	Each	$ 181,204	8	$1,449,630	$0
Road Storm Patrols	Miles	$ 552	100	$55,180	$0
Road Gates	Each	$ 7	8,660	$60,620	$0
Burnout Cavities under Forest System Road	Each	$ 1,679	6	$10,074	$0
Hazard Tree Falling At Road Treatments	Miles	$ 337	107	$35,910	$0
Implementation Team	Days	$ 600	60	$36,000	$0
Subtotal Road & Trails				$2,187,412	$0
D. Protection/Safety					
Road Warning Signs	Each	$ 256	48	$12,300	$0
Hazard Trees Along 1376 Road	Days	$ 6,864	6	$41,184	$0
Hazard Trees at Recreation Facilities	Each	$ 75	372	$27,900	$0
Repair Bridge Approach Guardrail	Each	$ 4,940	3	$14,820	$0
Recreation Site Gate Closure to Gravel Bar	Each	$ 3,500	6	$21,000	$0
Recreation Warning Signs	Each	$ 325	26	$8,450	$0
Vault Toilet Protection	Each	$ 336	11	$3,700	$0
Subtotal Protection/Safety				$129,354	$0
E. BAER Evaluation					
Assessment Team	Report	$ 278,943	1		$278,943
Subtotal Evaluation				---	$278,943
F. Monitoring/Coordination				---	
Interagency Coordination	Days	$ 400	20	$8,000	$0
Subtotal Monitoring				$8,000	$0
G. Totals					$278,943
Previously approved				$10,000	
Total for this request				$2,464,442	
Total Requested				$2,474,442	

PART VII - APPROVALS

1. /s/ Eric Kerstel — 10/18/17
Acting Forest Supervisor (signature) — Date

2. /s/ — _____
Regional Forester (signature) — Date