

BURNED-AREA REPORT
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST****A. Type of Report**

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

B. Type of Action

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

2. Interim Report

- Updating the initial funding request based on more accurate site data or design analysis
 Status of accomplishments to date

3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION**A. Fire Name:** Cougar Creek Fire**B. Fire Number:** WA-YAA-00157**C. State:** Washington**D. County:** Klickitat County**E. Region:** 06**F. Forest:** Gifford Pinchot National Forest**G. District:** Mt. Adams RD**H. Fire Incident Job Code:** PAJ1AZ**I. Date Fire Started:** August 10, 2015 **J. Date Fire Contained:** September 15, 2015**K. Suppression Cost:** \$23 M**L. Fire Suppression Damages Repaired with Suppression Funds**

1. Fireline waterbarred (miles): 0
2. Fireline seeded (miles): 0
3. Other (identify):

Roadside slash chipping and spreading, road grading, log bucking and decking, structure protection (wrapping and unwrapping, sprinkler system set-up and removal, clearing defensible space), stream repair at dozerline/stream junctions

M. Watershed Number:**N. Total Acres Burned:** 57,929 acres

NFS (6,547 acres) Other (51,382 acres)

O. Vegetation Types:

Mountain hemlock series
 Pacific silver fir series
 Subalpine series
 Grand fir series

P. Dominant Soils:

Soils information for the burn area is from the Gifford Pinchot National Forest Soil Resource Inventory¹, GIS analysis, and field observations. Slopes of less than 30 percent dominate the burn area, with exceptions of rock outcrops and cinder cones. Derived from basalt, glacial till, pumice, and volcanic ash, soils are commonly shallow with exposed rock on the steeper slopes. Most soils are one to six feet deep from material ejected during volcanic eruptions.

Rocky soils of Soil Map Units (SMU) 45 and harsh growing conditions of SMU 46 occupy much of the higher elevations of burned area west of Forest Service-Yakama Nation boundary. SMU 95 is common in the southern area of the fire, south of Snipes Mountain (Table 1), where soils in lower elevations are deeper and more productive than the soils (SMU 45 and 46) in the upslope areas of.

Porous, fractured basalt bedrock contributes to droughty soil conditions in the summer season, but other factors influence water movement through the soil. Volcanic soils naturally exhibit water repellency when dry, which results in an annual delay in rain saturation of soils following the dry summer. Also, hydrophobic substances hinder the movement of water out of water repellent soil and more water is retained in water repellent soil than in wettable soil², to the detriment of water available to plants. Soil temperature is cold, classified as cryic temperature regime, and grouped in a moist soil taxonomic class as udic moisture regime.

Table 1. Selected Soil Interpretations from Wade, et. al, 1992.

SMU	Landform	Elevation (feet)	Surface Erosion Potential	Natural Regeneration Potential	Area (Acres)
1795	50-50: Valley Bottoms, Toeslopes, Gentle Ridgetops, and Benches at Higher Elevations	4000-4500	Moderate	Low-Moderate	451
2	Lava Flow	ALL	Slight	N/C	622
45	Gently Sloping, Benchy Topography at Higher Elevations	4100-5000	Moderate	Low	1485
46	Gently Sloping, Irregular, Benchy Topography at Higher Elevations	5000-6000	Moderate	N/A	1491
5B	Steep Cinder Cones	ALL	Slight to Moderate	Low	273
7	Rock Outcrop and Talus on Rugged Landforms	ALL	Moderate	Low	42
93	Smooth, Gentle Sideslopes and Terraces	2500-4000	Moderate	Moderate	1
95	Gentle Ridgetops and Benches at Higher Elevations	3200-4200	Moderate	Low-Moderate	1325
Q	Quarry	ALL	NA	NA	4
Total					5694

¹ Wade, J.; Herman, L.; High, C. T.; Couche, D. 1992. Soil Resource Inventory. Gifford Pinchot National Forest. Vancouver, Washington.

² DeBano, L.F. 1981. Water Repellent Soils: a state-of-the-art. US Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station. Government Technical Report PSW-46.

Q. Geologic Types:

The Cougar Creek Fire burned a large area on the south and eastern flanks of Mount Adams, a major Cascade Range stratovolcano. This volcano has been sporadically erupting for the last 500,000 years; growing over 12,000 feet high and encircled by a thick apron of mostly andesite lava flows that extend about 10 miles from the summit in all directions. Eruptions have been dominated by fluid lava flows, with only rare pyroclastic flows and ash fall. Repeated glacial advances have scoured much of the looser volcanic deposits from the volcano's upper flanks. During the most recent ice age, about 15,000 years ago, large valley glaciers occupied all the major valleys.

Areas on the south flank of Mount Adams are underlain with fractured and glaciated basalt flows, sometimes prone to debris avalanches and lahars. Along the treeline facing the south slopes of Mount Adams are a combination of rock outcrop, talus, and dry meadows with rocky shallow soils. The sparsely vegetated Aiken Lava Bed is situated in the middle to western side of the burn area on FS lands.

R. Miles of Stream Channels on FS lands within the perimeter burn:

Perennial- 16.2 miles

Intermittent- 14.9 miles

S. Transportation System

Trails- 15 miles

Roads-Operational Maintenance Level 2 – 14.4 miles,

Operational Maintenance Level 1 – 2.1 miles

PART III - WATERSHED CONDITION

A. Burn Severity by total and FS (acres):

Soil Burn Severity	Total Burn Area (Acres)	Total Burn Area (%)	FS lands Burn Area (Acres)	FS Lands Burn Area (%)
Unburned/Very Low	8209.8	14	1,772.7	27
Low	1,4378.7	25	1,325.4	20
Moderate	28,419.4	49	2,922.5	45
High	6,920.9	12	526.5	8
TOTAL	107,803.6	100	6,547.1	100

B. Water-Repellent Soil by total and FS (acres):

Water repellancy was observed at about 3 inches depth in the few areas visited although the BAER team had limited access to the burned area due to safety concerns of standing snags. As a result, the total area of water repellent soil within the burned area could not be thoroughly estimated.

C. Soil Erosion Hazard Rating by total (acres):

626 (low) 5,068 (moderate) 0 (high)

D. Erosion Potential:

7.9 tons/acre (moderate burn severity) -12.3 tons/acre (high burn severity)³

E. Sediment Potential: 1813 to 3045 cubic yards/square mile in areas with slopes.

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):	<u>5</u>
B. Design Chance of Success, (percent):	<u>70</u>
C. Equivalent Design Recurrence Interval, (years):	<u>10</u>
D. Design Storm Duration, (hours)	<u>24</u>
E. Design Storm Magnitude, (inches)	<u>1.0</u>
F. Design Flow, (cubic feet / second/ square mile) ⁴ :	<u>114-136</u>
G. Estimated Reduction in Infiltration, (percent):	<u><1%</u>
H. Adjusted Design Flow, (cfs per square mile) ⁴ :	<u>138-170</u>

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Resources at Risk

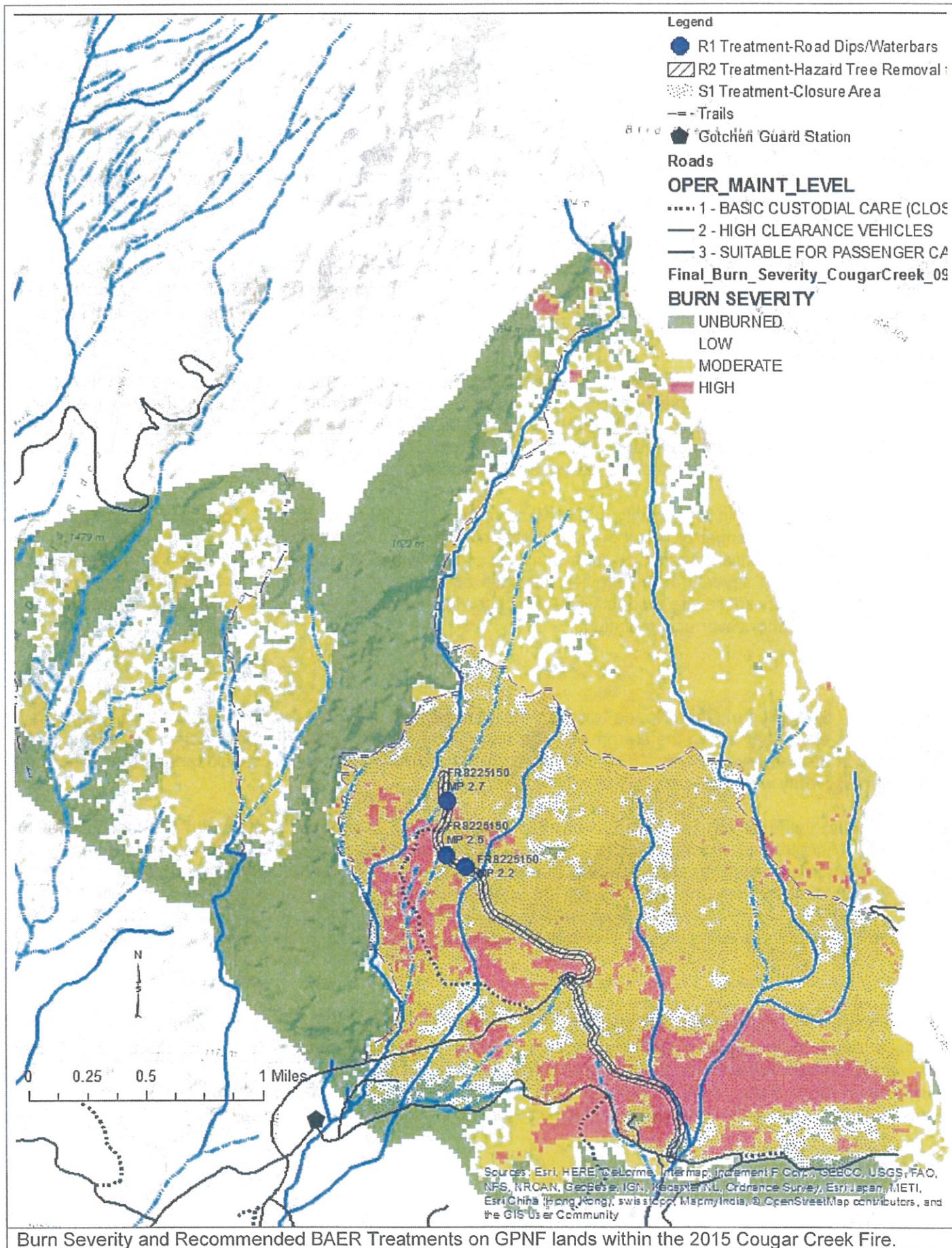
The Cougar Creek Fire began on August 10, 2015 as the result of a lightning strike. The burned area is located on the south flank of Mt. Adams where approximately 10% of the wildfire is on FS lands of the Gifford Pinchot National Forest. The subwatershed on FS lands affected by the burn is Gotchen Creek-White Salmon River (27,830 acres). Only the northeastern portion of this subwatershed was within the burn perimeter. Gotchen Creek is the one perennial stream within the burn perimeter and most of the headwaters streams flowing into Gotchen Creek are intermittent.

The 2008 Coldsprings Fire (4776 acres of FS lands) overlapped closely with the perimeter of 2015 Cougar Creek Burn and was reburned. The 2013 Cascade Creek Fire also overlapped the western side of the Cougar Creek Burn Area where burn severity was predominately moderate or low/unburned.

A Burned Area Reflectance Classification (BARC) satellite-derived map of postfire vegetation condition was obtained from the BIA BAER Team Lead, Chris Holbeck. The burn severity classes on the BARC map were used to determine values at risk from runoff, potential debris flows and sediment from the fire that could affect critical resource values (Figure 1).

³ Estimates are from the 2008 Coldsprings BAER report which used the ERMiT model to estimate erosion and sediment potential.

⁴ Elliot, William J.; Hall, David E.; Robichaud, Peter R. 2010. Forest Service Peak Flow Calculator. Ver. 2012.08.02. Moscow, ID: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Online at <http://forest.moscowfsl.wsu.edu/fswepp/ermit/peakflow>.



Soils

Areas of high and moderate burn intensities removed effective groundcover and live vegetation, often with no potential for needle cast mulch, as judged from photographs and field accounts. Interior burn access to validate BARC map burn severity was limited. A few hydrophobicity tests were done which noted a hydrophobic depth of 3 centimeters, but were not considered as fire induced. Hydrophobicity was field validated at areas along FR 8020150 road (GPS points 314,319, 320-323). Exposed soils within the high burn intensity area may be susceptible to increased erosion for the first storms of the year. Increased erosion can be expected in the intermittent drainages that have moderate and high severity burns areas although many of the drainages flow onto flat ground where sediment movement would be extremely limited.

Moderate risk of surface erosion exists where burn severity was "moderate" or "high" in the same locations as "high" burn severity of the 2008 Cold Springs Fire. This was prevalent on a band of SMU 45 and SMU 46 between elevations of 4500 and 5000 feet. Some rill erosion was evident at the time of the field survey in limited areas from a light summer precipitation event.

Exposed soils may be susceptible to increased erosion for the first storms of the year. Absent treatment, soil loss is anticipated where burn severity is high on areas with slopes although the extent of these higher sloped areas is limited. Concern about a potential loss of soil productivity due to accelerated soil erosion resulting from the absence of groundcover and presence of hydrophobic soils exists where duff has been consumed due to a higher likelihood of soil particle detachment by raindrop impact.

Additionally, soil losses in productivity in the areas of high burn severity of 2008 Cold Springs Fire that were reburned may persist longer or result in higher rates of erosion as a consequence of being burned twice. Soil loss can have a significant impact on long-term soil productivity. Consumption of the duff and litter layer in areas with high burn severity of the previous fire has already affected site productivity and repeated loss of topsoil would further reduce site productivity. Rate of soil loss in subsequent years will depend on recovery rate of vegetation and litter cover accumulation.

Roads

Few roads (14.4 miles of Open Roads) exist on FS lands within the Burn Area, and most of these roads have few culverts since they are in the flat areas. The expectation for any debris flow originating upslope to reach the roads in the flat areas is low. No debris flows occurred following the previous Coldsprings burn where the High Burn Severity was also estimated as about 10%.

The potential value at risk to property from the Cougar Creek burn area is limited to the last mile of FR 8225150. Accelerated runoff, rilling, sedimentation, and debris moving off the burned area threaten the existing road prism including subgrade and drainage. Additional runoff would also see increased downcutting along edges of road producing rills or gullies. Rolling dips or waterbars are recommended at specific locations on the 8225150 road for conveyance of surface erosion from the upslope hillsides. In order to perform this treatment, hazard trees along the access route to the end section of road would need to be removed.

Trails

Snipes Mountain Trail and Pineway Trail may have limited sections at risk surface erosion caused by elevated surface runoff from adjacent and/or upslope areas rated as High or Moderate Burn Severity that were previously burned. Rill erosion, sheeting and some sloughing of soils are expected to be minimal and in limited sections of these trails. Risk of damage from surface erosion due to surface runoff from upslope areas is considered possible with moderate to limited damage to the trail expected.

Invasive Plants

The critical resource value to be protected are native plant communities on National Forest Service lands where invasive species/noxious weeds are absent or are present only in minor amounts. Invasive plants known to be present in the burned area in patchily distributed occurrences include *Cirsium arvense* (Canada thistle),

C. vulgare (bull thistle), *Hypericum perforatum* (St. John's wort), and *Senecio jacobaea* (tansy ragwort). The spread of invasives to native plant communities where invasive species/noxious weeds are absent or are present only in minor amounts is expected to be low, as the area will be closed to recreational use and livestock will not be occupying this area during the first year.

Heritage Resources - Gotchen Creek Guard Station:

Gotchen Creek Guard Station is the oldest standing historic structure on the GPNF and listed on the National Register of Historic Places. Constructed in 1909, the cabin is a well-preserved example of simple, elegant, and functional early Forest Service architecture. The cabin is in an unburned area, near the southwest corner of the burn perimeter. Gotchen Creek or the ditch located near the cabin are not expected to have excessive flows caused from the burn area because of the limited area in High Burn Severity in the drainage areas.

Water quality and fisheries

No 303(d) listed impaired streams (Category 5) exist in the White Salmon River watershed, according to a 2012 Washington state Water Quality Assessment report. The Congresssionally-designated Wild and Scenic River corridor along the White Salmon River does not include Gotchen Creek and is significantly downstream of the burn area. Water quality (turbidity) and fish in this Wild and Scenic River are not expected to be affected by any sediment delivery from the burn area to Gotchen Creek headwater streams.

Gotchen Creek, a non fish bearing creek, may have precipitation dependent increases in turbidity and sediment delivery from the release of ash and loosened burned soils in the headwater channels within high severity burn areas on steep slopes, especially during the first rain event. Any increase in turbitiy and sediment delivery to Gotchen Creek is expected to only be transported short distances due to the gentle gradients of the creek downstream of the burn area. These events will occur during significant rainfall events until there is sufficient vegetative recovery to reduce surface runoff and erosion.

Critical Values Identified⁵

The BAER team evaluated the risk to each identified critical value using the Magnitude of Consequences on Probability of Damage or Loss matrix (Table 2). The estimated risk levels to downstream critical values were based on a 24 hour design storm with a 10 year recurrence interval approximating 1.0 inch of rainfall (Table 3). The Very High and High Risk are unacceptable risk levels due to threats to human life, property, infrastructure and resources, therefore treatments should be applied. An Intermediate Risk could be unacceptable if human life or safety is the critical value at risk.

Table 2. Magnitude of Consequences on Probability of Damage or Loss

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	Loss of life or injury to humans; substantial property damage; irreversible damage to critical natural or cultural resources.	Injury or illness to humans; moderate property damage; damage to critical natural or cultural resources resulting in considerable or long term effects	Property damage is limited in economic value and/or to few investments; damage to natural or cultural resources resulting in minimal, recoverable or localized effects
RISK			
Very Likely (>90%)	Very High	Very High	Low
Likely (>50% to <90%)	Very High	High	Low
Possible (>10% to <50%)	High	Intermediate	Low
Unlikely (<10%)	Intermediate	Low	Very Low

⁵ Per FSM 2523.1 Exhibit 01 (Interim Directive 2520-2012-1)

Table 3 .Values at Risk to Life and Property, Natural or Cultural Resources

Value at Risk: Life or Property, Natural or Cultural Resources			
Risk	Probability of Damage or Loss	Magnitude of Consequences	Value at Risk
Very High	Likely	Major	Loss of life or injury to humans from Administrative or Recreational Use of High Severity Burn Areas with Snags
High	Likely	Moderate	Moderate property damage to Forest Road 8225-150 prism
Intermediate	Possible	Moderate	Moderate damage to critical natural resources resulting in considerable or long term effects of native vegetation becoming infected by invasive seed sources
Intermediate	Possible	Moderate	Moderate property damage to short section of Snipes Mountain or Pineway Trails (Areas of high or moderate burn severity with slopes)
Low	Unlikely	Moderate	Damage to cultural resources resulting in considerable effects from sediment laden stream flow reaching the Gotchen Creek Guard Station
Low	Unlikely	Minor	damage to natural resources resulting in minimal, recoverable or localized effects to water quality (increase turbidity and sediment delivery in Gotchen Creek during rain events)

B. Emergency Treatment Objectives (narrative):

Enforce a forest order of closure in the high burn severity areas, specifically the area south of Pineway trail, east of the Aiken Lava Bed, west of FR 8200285 and north of FR 8200060. Warn the public of the dangers associated with hazard trees along trails by signing all trail heads and posting information on the Forest's website.

Prevent probable burn-related damage to roads due to anticipated increased post-fire erosion and debris movement by performing the minimum amount of drainage work on FR8225150 necessary to reduce the risk of damage to the road prism. Ensure the safety of BAER implementation personnel by removing hazard trees along FR8225150 where drainage work is implemented.

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

Land Roads 95 % Trails Protection/Safety 95%

D. Probability of Treatment Success

		Years after Treatment		
		1	3	5
Land		NA	NA	NA
Roads		90	80	70
Trails		NA	NA	NA
Protection/Safety		90	90	90

E. Cost of No-Action (Including Loss): Loss of Life and \$ 30,000 loss of infrastructure.

F. Cost of Selected Alternative (Including Loss): \$ 24,000

G. Skills Represented on Burned-Area Survey Team:

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

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H. Treatment Narrative:

Treatment #T1 addresses the very high risk to life. A closure order will be posted and remain in effect for one winter season. Enforcement of the closure is necessary due to the popularity of the area for winter recreation, and previous lack of success in reliance on voluntary abidance to a similar closure order in the same area.

Treatment #2 will address the High risk to property, the road prism of FR 8225150. Water bars or rolling dips constructed with heavy equipment are recommended in select locations (MP 2.2, 2.5, and 2.7) to assure surface flows do not damage the road prism. Additionally, hazard trees will be treated along the access route through the high burn severity areas to address the high risk to life of those implementing the treatments.

The risks to Cultural and Natural Resources were considered Intermediate or Low, and will not be recommended for BAER treatments. These would have included trail erosion control measures, invasive survey and heritage site protection.

Roads and Trail Treatments

Purpose: Prevent the loss of FR8225150 road prism and remove hazard trees from the BAER Treatment access route.

Treatment –Construct water bars or rolling dips at specified locations along 8225150 between MP 2.2, 2.5 and 2.7 and treat hazard trees along the access route. Provide drainage on this road to reduce the risk of sediment laden surface flow from eroding the road and contributing additional sediment to any overland flow.

R1 3 water bars or rolling dips @\$1200 each: \$3,600

R2 Remove high hazard trees along 2.7 miles of FR8225150 \$6,750

TOTAL COST OF PROPOSED BAER TREATMENTS FOR ROADS AND TRAILS: \$10,350

Protection/Safety Treatments

Purpose: Enforce a forest order closing the high burn severity areas. Install signage to restrict hikers and trail users from accessing closed area.

Treatment Closures, hazard warning signs, trail warning/info, and enforcement: Produce hazard signs and warning trail signs for notifying public users of trails. Inform public of closure of roads with signage to prevent access and protect public safety. Warning signs should be posted at trailheads.

S1 Closure info, hazard signs & other public notification for first quarter FY16: \$ 2,000

S2 Enforce Forest Order of closure (2 people, 2 hours per day, 5 days a week, for 16 weeks) \$10,320

TOTAL COST OF PROPOSED BAER TREATMENTS FOR PROTECTION/SAFETY: \$12,320

I. Monitoring Narrative: No BAER funds are requested for monitoring these treatments.

TOTAL COST FOR MONITORING: \$0

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

Line Items	Units	Unit Cost	NFS Lands			Other Lands			All
			# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	
A. Land Treatments									
acres				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
Subtotal Land Treatments				\$0	\$0		\$0		\$0
B. Channel Treatments									
				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
Subtotal Channel Treat.				\$0	\$0		\$0		\$0
C. Road and Trails									
R1-Dips in FR8225150	each	1200	3	\$3,600	\$0		\$0		\$3,600
R2-hazard tree treatment	miles	2500	2.7	\$6,750	\$0		\$0		\$6,750
				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
Subtotal Road & Trails				\$10,350	\$0		\$0		\$10,350
D. Protection/Safety									
S1-Close/sign trails	area	2000	1	\$2,000	\$0		\$0		\$2,000
S2 - Enforcement	weeks	645	16	\$10,320	\$0		\$0		\$10,320
				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
Subtotal Structures				\$12,320	\$0		\$0		\$12,320
E. BAER Evaluation									
				\$5,100					
				---			\$0		\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0
Subtotal Evaluation				---	\$0		\$0		\$0
F. Monitoring									
Field Review	days			\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0
G. Totals									
Previously approved									
Total for this request				\$22,670	\$0		\$0		\$22,670

PART VII - APPROVALS

1.

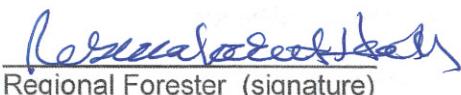


Forest Supervisor (signature)

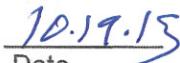


Date

2.



Regional Forester (signature)



Date