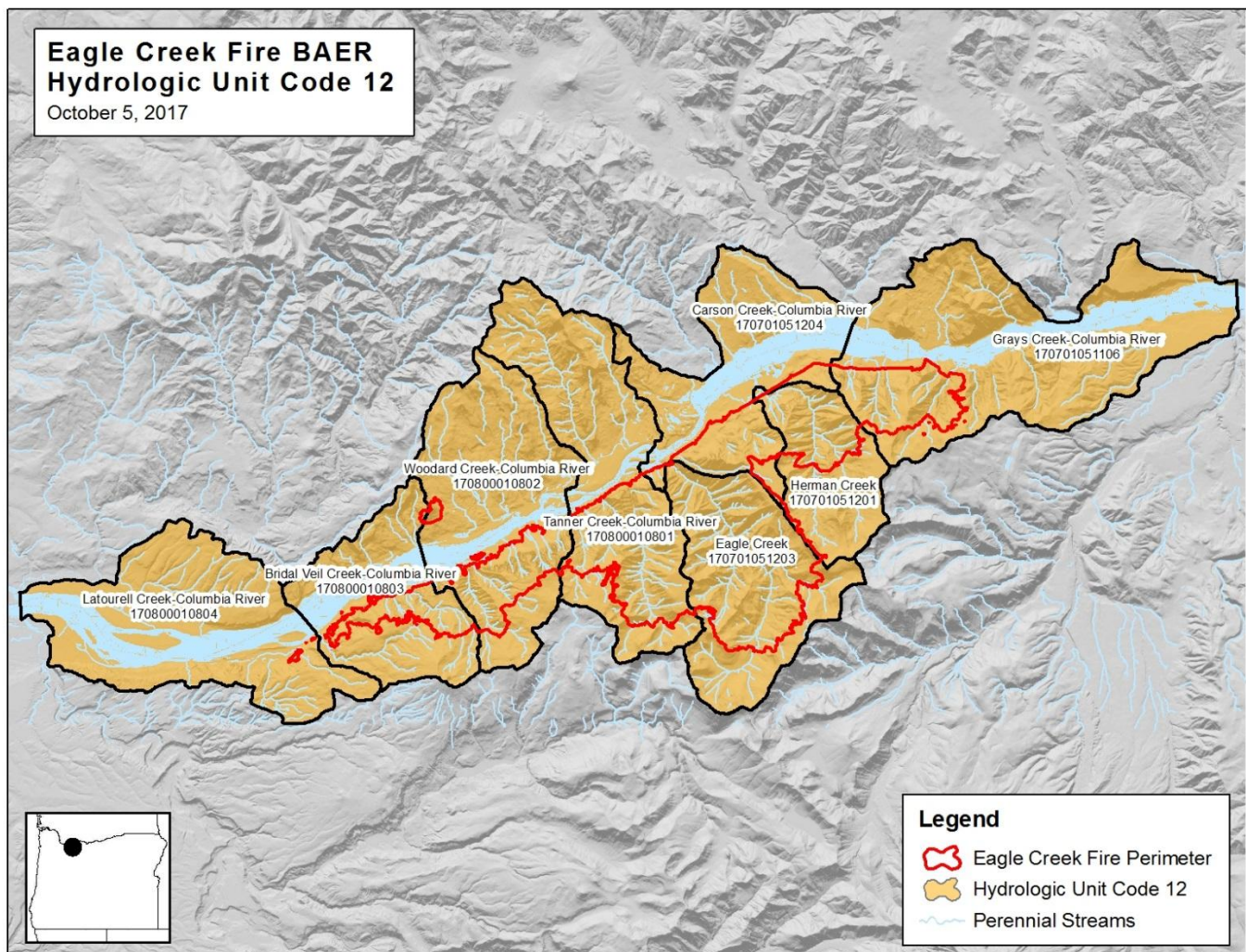


(Reference FSH 2509.13)

Sub-watershed Name	Total Sub-watershed Acres (Percent Burned)		Soil Burn Severity						
			Unburned or Very Low	Low		Moderate		High	
Bridal Veil Creek-Columbia River	18,072	(18%)	1,482	852	(5%)	798	(4%)	78	(<1%)
Carson Creek-Columbia River	23,013	(21%)	2,184	1,479	(6%)	854	(4%)	275	(1%)
Eagle Creek	22,180	(68%)	3,115	3,246	(15%)	5,334	(24%)	3,333	(15%)
Grays Creek-Columbia River	41,409	(13%)	1,113	2,882	(7%)	1,352	(3%)	24	(<1%)
Herman Creek	12,248	(40%)	2,022	1,933	(16%)	850	(7%)	135	(1%)
Latourell Creek-Columbia River	29,667	(<1%)	41	13	(<1%)	0	0	P	0
Tanner Creek-Columbia River	29,512	(33%)	1,603	1,538	(5%)	3,625	(12%)	2,963	(10%)
Woodard Creek-Columbia River	28,211	(20%)	1,800	1,552	(6%)	1,788	(6%)	493	(2%)
Grand Total	204,312	(24%)	13,361	13,494	(7%)	14,602	(7%)	7,301	(4%)



N. Total Acres Burned: 48,787 total acres

NFS Acres(47,231) State of Oregon (45) Oregon State Parks (1,282) Private (230)

O. VegetationTypes: Vegetation types and plant association groups within the fire consisted of primarily western hemlock zone (37,418 acres). Other vegetation types are Pacific Fir zone (9,706 acres), Grand Fir zone (880 acres), Douglas Fir Zone (500 acres), steppe (174 acres), Mountain Hemlock Zone (58 acres) and other vegetation types (51 acres).

P. Dominant Soils: Surface soils have sandy loam to silt loam surface textures, depending on landscape position, and are generally cobbly/stony. Rock outcrops and scree slopes are common. At low and mid elevations, soils primarily formed in slope-transported material from Columbia River basalts and andesites. At upper elevations, soils are more likely to be influenced by wind-blown loess and have siltier textures. These higher-productivity soil types often burned with the highest severity, likely because of higher vegetative productivity and denser ground fuels. These soils are most susceptible to post-fire soil productivity losses. They are more susceptible to erosion when burned, especially where surface rock armoring is low. Rock surfacing and significant needle cast are expected to lessen post-fire erosion risk in many areas.

Q. Geologic Types: The Columbia River Gorge began to take its current shape between 17 and 6 million years ago. During this time the Columbia River Basalt Group (CRB) poured out of feeder dikes in eastern Washington and Oregon, travelling westward along the ancestral Columbia River, eventually reaching the Pacific Ocean. Over 300 individual flows covered an area of approximately 105,000 mi² and constitute a volume of about 41,830 mi³ (Norman and Roloff, 2004). Tectonic uplift of the CRB via the development of the High Cascade Range, and contemporaneous down cutting by the Columbia River led to a broad, north to south, gently-dipping anticline, spanning a 70 mi stretch between Troutdale, Oregon and The Dalles, Oregon. The Columbia River continuously cut through the more competent CRB, exposing the weaker, underlying Eagle Creek Formation. Because the CRB dips gently from north to south and overlies the weaker Eagle Creek Formation, massive, deep-seated landslides develop along the Washington side of the Gorge, leading to broader, lower-angle terrain on the Washington side, and vertical exposures of CRB on the Oregon side of the Gorge. Overlying the CRB are volcanic products of the Cascade Range. Cascade volcanics consist primarily of andesite and basalt, but locally include lahar and pyroclastic deposits which may provide initiation material for debris flows.

R. Miles of Stream Channels by Order or Class:

Streams	Miles
Perennial	141.4
Intermittent	184.4
Grand Total	325.8

S. Transportation System

Trails: 121.4 Miles CRGNSA Trails: 83.5 Mt. Hood NF Trails: 37.9 Miles
Wilderness Trails: 83 miles PCNST Miles: 10.1 miles

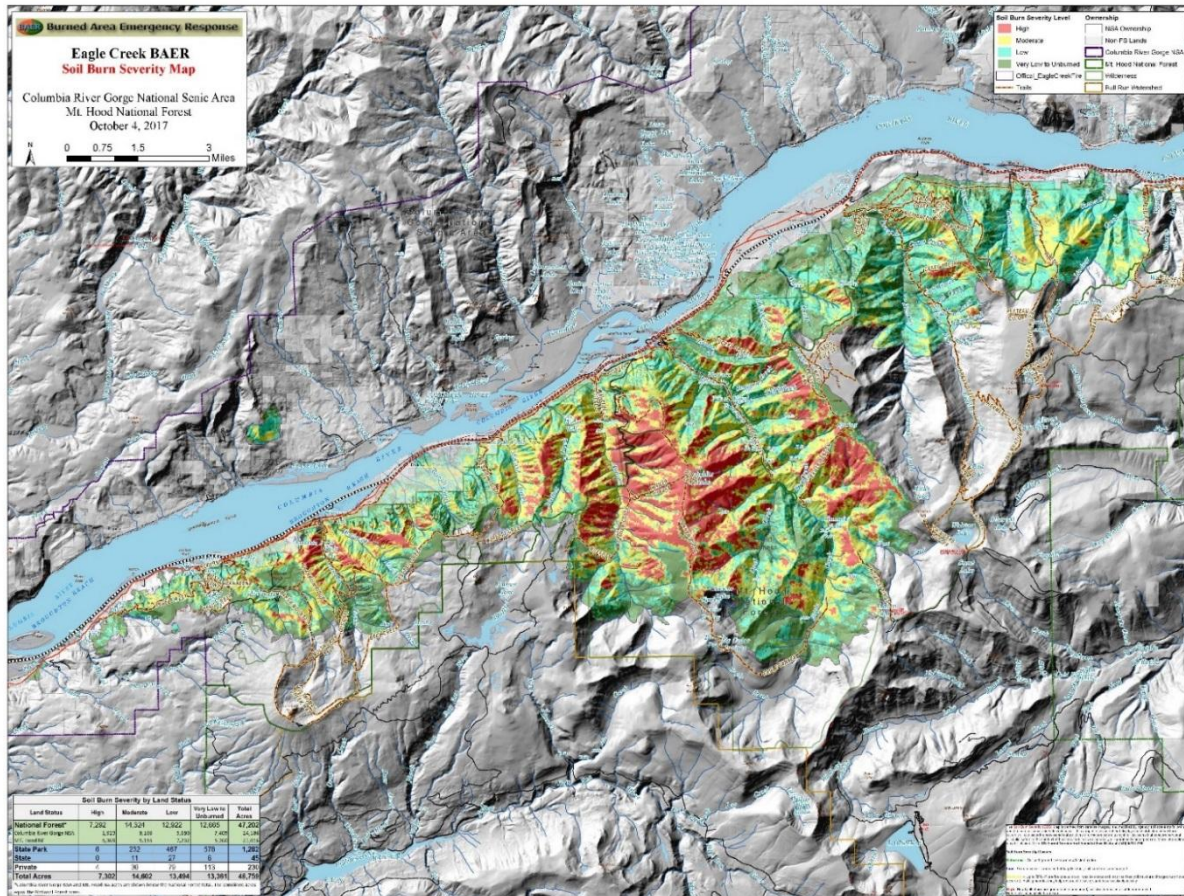
Roads:

Maintenance Level	Miles
1 - BASIC CUSTODIAL CARE (CLOSED)	1.43
2 - HIGH CLEARANCE VEHICLES	10.47
4 - MODERATE DEGREE OF USER COMFORT	0.53
Grand Total	12.43

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Soil Burn Severity	NFS (acres)	State (acres)	Private (acres)	State Park (Acres)	Total (acres)	Soil Burn Severity (%)
High	7,296	0	4	6	7,306	15
Moderate	14,332	11	36	232	14,611	30
Low	12,930	27	79	467	13,502	28
Unburned/Very Low	12,673	6	113	578	13,369	27
Total	47,231	44	232	1,283	48,788	100

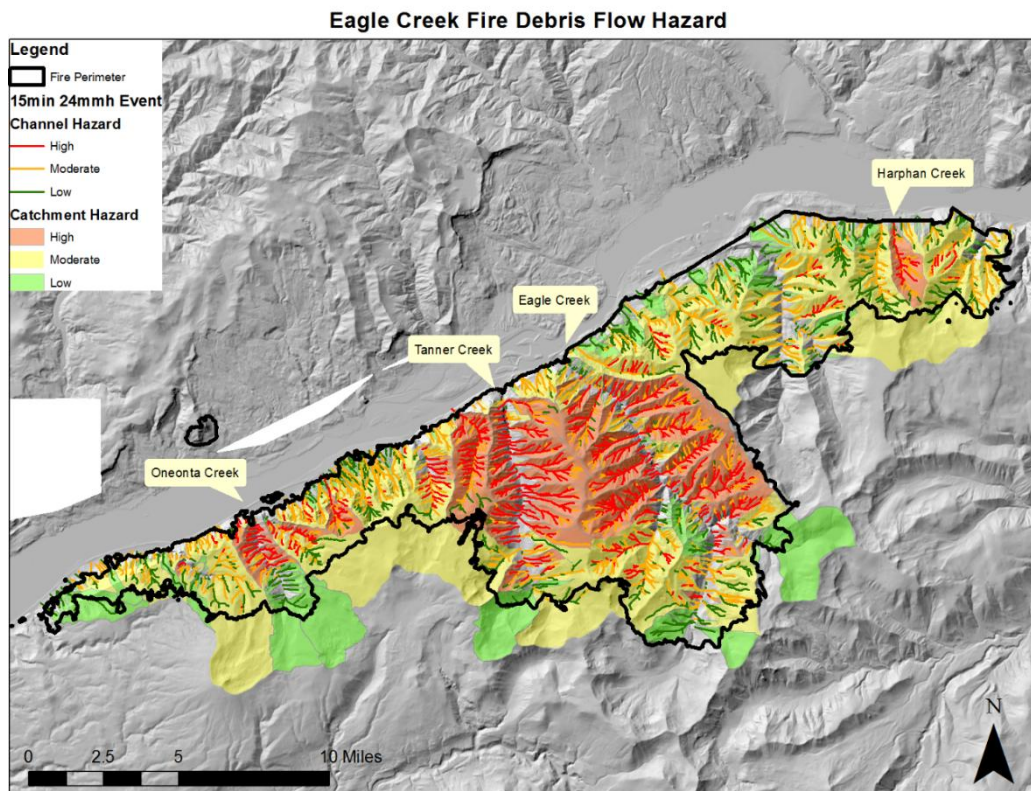


- B. Water-Repellent Soil (acres):** Estimated at 15,850 acres (32% of the fire area). Based on limited field reconnaissance, we determined that about 60% of the moderate and high severity acres were water repellent, and about 20% of the low severity acres were water-repellent (changes beyond background levels). Natural water repellency is present.
- C. Soil Erosion Hazard Rating (acres):** Due to the lack of soil survey data necessary to evaluate Erosion Hazard Rating, it could not be accurately estimated/summarized for the fire area. Broad trends were observed: rock-armored soils and soils on gentler topography likely have Slight to Moderate Erosion Hazard, while finer textured soils on steep slopes likely have Moderate to Severe Erosion Hazard.
- D. Erosion Potential:** The following erosion rates for selected pour points of concern were calculated from post-fire erosion models for a ten-year storm in GeoWEPP (see Soils Report). These values represent what would have been the likely post-fire erosion values, but significant erosion events had already occurred prior to the BAER team analysis (major wind event during the fire, and major precipitation event September 18-19). Based on observed recovery and stabilization of soils in high burn severity areas of the Tanner Creek drainage, it is believed that erosion rates from this point forward will be substantially lower than those shown below.

McCord Creek Trail Bridge: 5.3 tons/acre
 Moffett Creek Trail Bridge: 3.3 tons/acre
 Multnomah Creek Near Bridge: 1.2 tons/acre
 Oneonta Creek Highway 30 Bridge: 2.1 tons/acre
 Tanner Creek Bridge: 7.1 tons/acre

- E. Sediment Potential:** A small fraction of the tons per acre predicted in the erosion models will actually make it to a stream. However, we do not have the data needed to make accurate predictions on sediment potential.

F. Debris Flow Potential: The USGS provided a preliminary post-fire debris flow hazard assessment (Staley and Kean, 2017) that relies upon empirical models to estimate the probability and volume of debris flows for selected basins in response to a specified design storm. The models are based upon historical debris-flow occurrence and magnitude data, rainfall storm conditions, terrain and soils information, and burn-severity data from burned areas within the Eagle Creek Fire perimeter. The model estimates post-fire debris-flow probability, volume, and combined hazards at both the drainage basin scale and in a spatially distributed manner along the drainage network within each basin (USGS, 2017). It is important to note that “[t]he hazard assessments are based upon models that were developed, calibrated, and tested in more arid parts of the western U.S., and may not be as accurate in western O[regon] where post-fire debris-flow hazard is still largely unexplored and not yet quantified” (Staley, October 2017, personal communication). For this assessment, we chose to use the stream network debris flow hazard probabilities as opposed to the drainage basin debris flow hazard probabilities, as observations and historical information indicate that debris flows in the Columbia River Gorge primarily initiate within channels as opposed to slopes within drainage basins. Results indicate that 31% of drainages are at high risk, 42% at moderate, and 28% are low. Drainages at highest risk for debris flow initiation include Eagle, Tanner, Moffett, McCord, Horsetail and Oneonta Creeks.



PART IV - HYDROLOGIC DESIGN FACTORS

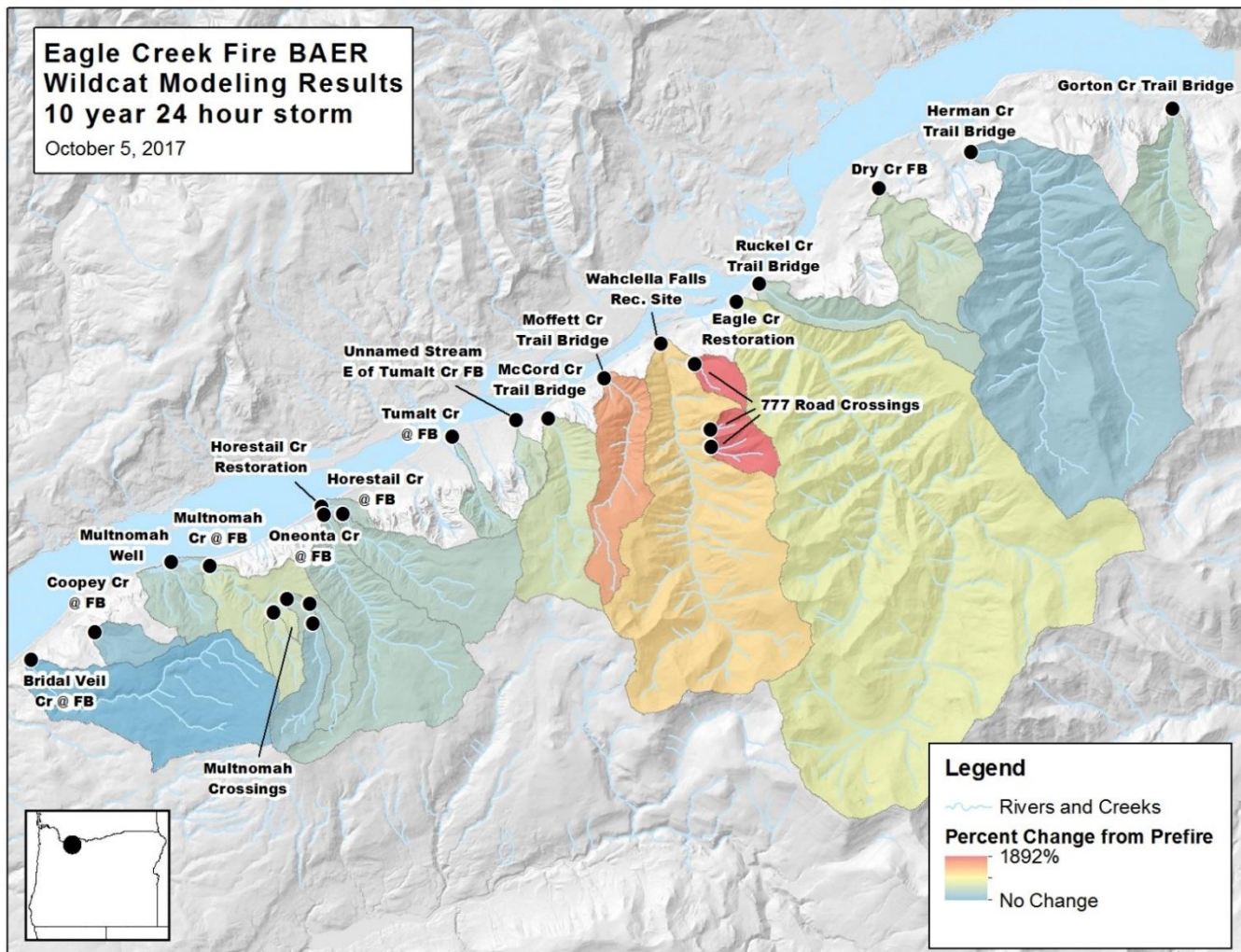
A. Estimated Vegetative Recovery Period	5-10 years
B. Design Chance of Success	80%
C. Equivalent Design Recurrence Interval	10 years
D. Design Storm Duration	24 hours
E. Design Storm Magnitude	6 inches
F. Design Flow	180 cfs/mi ²
G. Estimated Reduction in Infiltration	27%
H. Adjusted Design Flow	1092 cfs/mi ²

Summary of Watershed Response

Hydrologic Response: The primary watershed responses of the Eagle Creek Fire are expected to include: 1) an initial flush of ash, 2) rill and gully erosion in drainages and on steep slopes within the burned area, 3) potential dam break floods and flooding associated with rain-on-snow events with increased peak flows and sediment deposition. Dam break floods have the potential to increase channel bed scour, sedimentation and flooding. These responses are expected to be most evident during initial storm events immediately after the fire. Responses are expected to become less evident as vegetation is reestablished, providing ground cover, increasing surface roughness, and stabilizing and improving the infiltration capacity of the soils. As trees fall down over the fall and winter, they have the potential to break up the hydraulic slope length and delay runoff timing.

Predicted post-fire peak flows show an increase for the 10-year storm from pre-fire. Post-fire flows could lead to plugged culverts, flow over road surfaces, and rill and gully erosion of cut and fill slopes, erosion and deposition along road surfaces and relief ditches, loss of long-term soil productivity and threats to human life and safety. Debris dam break-out flooding will be a continuing threat for years or decades to come.

Wildcat 5 hydrologic modeling was performed on 24 points at or near identified values at risk. The model uses burn severity, slope and soil type to model flows generated in areas above "pour points" or values at risk. Results are presented as a percent change in flows from pre-fire to post-fire conditions. Actual modeled flow results are considered less reliable than the actual percent difference between them. The figure below shows the results with the highest changes (red) also being the highest at risk from flooding (i.e. 777 road). See the Hydrology Report for more details.



Erosion Response: Field reconnaissance showed that most areas identified on the SBS as moderate burn severity already had significant surface cover reestablishing from needle fall (approaching 100% in many areas). Additionally, many (if not most) soil areas have a substantial surface rock cover that shields the soil from raindrop impact and entrains/slows surface runoff, allowing it to infiltrate into the soil. Areas the burned at high severity generally lack needle cover because crowns were fully consumed. These areas of high severity burn where finer textured, low-rock content soils are present are the most susceptible to erosion. However, wind scour during the fire and the large precipitation event that occurred around September 18 and 19 resulted in a substantial amount of erosion (as evidenced by exposed tree roots, rills on slopes, and scorch lines on stumps). Most of these areas are exhibiting signs of soil recovery--germinating plants, cover from fungi/mold layers, and a thick fungal hyphal mat that was often encountered at or near the soil surface. It is expected that the initial pulse of soil loss has already occurred, and that erosion rates on high severity burn areas will now be substantially lower than in the immediate post-fire environment. The primary areas of high soil burn severities occur in the Eagle Creek, Tanner Creek, Moffett Creek, and McCord Creek drainages.

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Values at Risk:

The table below is Exhibit 02 from FSM 2523.1. This matrix was used to evaluate the risk level for each value identified during this BAER assessment. See FSM 2523.1 for additional information.

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High	Very High	Low
Likely	Very High	High	Low
Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

The table below is a summary of the values (some of which were not identified as ‘critical’ per Exhibit 01 from FSM 2523.1) within and along the Eagle Creek fire area, as well as, the threats to those values, the probability of damage or loss, magnitude of consequences and the resulting level of risk. Red shaded cells are those values that rated out as “very high” or “high” risk. Yellow shaded cells rated out “intermediate” risk and white cells rated out “low” or “very low”.

Eagle Creek Fire BAER - Forest Service Values at Risk Tracking Table

High / Very High Risk	
Intermediate Risk	
Low / Very Low Risk	

Category	Life/ Property/ Resources	Value at Risk	Threat to Value at Risk	Probability of Damage or Loss	Magnitude of Consequence	Risk	Threat
Recreation	Life/ Property	Wahkeena Picnic Area/ Trailhead/ Pedestrian Bridge Hwy 30	Debris, flooding,	Possible	Moderate	Intermediate	Trail S / Sto
Recreation	Life/ Property	Horsetail Falls Trailhead/ Viewing Site	Flooding, Debris Flow	Possible	Major	High	Clos
Recreation	Life/ Property	Shady Creek Bridge	Rock fall	Unlikely	Minor	Very Low	No T
Recreation	Property	Shady Creek Water Tank	Rock fall, Hazard Trees	Possible	Moderate	Intermediate	Ha Abat
Recreation	Life/ Safety	Benson Bridge	Hazard Trees, Rock fall	Possible	Major	High	Ha Abat Clos Impl
Recreation	Life/ Property	Multnomah Falls Lodge	Rock fall,	Very Likely	Major	Very High	R Catch along the l 15
		Parking Area					Rock

Property	Property	Herman Creek Work Center	Not in Fire				No T
Recreation	Life/ Property	Herman Creek Trailhead	Not in Fire				
Recreation	Life/ Property	Herman Creek Horse Campground	Not in Fire				
Recreation	Life/ Property	Eagle Creek Registration Booth	Trees, Rock fall	Unlikely	Minor	Very Low	No T
Recreation	Life/ Property	Eagle Creek Campground	Hazard Trees	Possible	Major	High	Ha Abat
Recreation	Life/ Property	Eagle Creek Picnic Shelter	Trees, Rock fall	Unlikely	Minor	Very Low	No T
Recreation	Life/ Property	Eagle Creek Trailhead/ Access Road	Flooding, Hazard Trees, Debris flow,	Likely	Major	Very High	Clou Gate (C Enf (P3), S (R ca behir
Recreation	Property/ Resources	Eagle Creek Suspension Bridge	Flooding, Debris Flow, Hazard Trees, Bridge Catching Debris	Very Likely	Major	Very High	Rem and D
Special Uses/ Recreation	Property	Eagle Creek Spring	Rock fall, Hazards Trees	Likely	Moderate	High	Ha Abate Int Coor

Recreation	Life/ Safety	Oneonta Gorge	Rock fall, hazard trees, flooding, debris flow, log jams	Likely	Major	Very High	Closure of Enforcement (P Inf
Recreation	Property	Oxbow Spring Box	No Threat				
Recreation	Life/ Property	Trails	Rock fall, hazard trees, loss of trail tread,	Very Likely	Major	Very High	Admin Closure Enfor P2, P Patrol Sta
Roads	Life/ Property	777 Road	Landslides, debris, hazard trees, washouts, emergency ingress/ egress for BPA personnel accessing powerline	Very Likely	Moderate	Very High	Clos p Inst four
Roads	Life/ Property	129 Road	Flooding, Debris Flow	Likely	Moderate	High	Sign Storm
Roads	Life/ Property	104 Road	Hazard Trees	Possible	Major	High	Sign with
Roads	Life/ Property	222 Road	Hazard Trees	Possible	Major	High	Sign with
Special Uses	Life/ Property	BPA Powerlines	Hazard Trees	Likely	Major	Very High	Int Coor
			Flooding has the potential to damage the structure				

Special Uses	Life/ Property	Bonneville Hatchery water intake on Tanner Creek	Flooding has the potential to damage the structure and deposit material making it in operable, hazard trees present a threat to damaging the structure and pose a threat to the personnel testing quality at the intake	Like	Moderate	High	Int Coord / S Prot
Special Use	Life/ Property	Oxbow Hatchery water intake on Herman Creek	Flooding has the potential to damage the structure and deposit material making it in operable, hazard trees present a threat to damaging the structure and pose a threat to the personnel testing quality at the intake	Possible	Moderate	Intermediate	No
Resources	Resources	Bull Run Watershed/ Admin Boundary	Reduction to Water Quality in Municipal Watershed	No Threat			
Resources	Resources	Spotted Owl and Critical Habitat	Continued loss of Late Successional Reserves from post-fire wind and storm events and post-fire insect and disease	Likely	Major	Very High	No Tr
Resources	Resources	Critical Habitat for Threatened Lower Columbia ESU Chinook Coho	Loss of critical habitat due to excess sedimentation, debris flow, increased turbidity, duration and	Likely	Moderate	High	N Tr

Resources	Resources						
Archaeology	Resources	Wagon Road	No threat	Unlikely	Minor	Very Low	No T
Archaeology	Resources	Old Quarry Site	No threat	Unlikely	Minor	Very Low	No T
Archaeology	Resources	Traditional Cultural Property					O ass
Archaeology	Resources	Tribal Fishing Access Sites/ In-Lieu Sites	Flooding, debris flows	Unlikely	Minor	Very Low	No T
Botany / Weeds	Resources	Wyeth Creek and vicinity-Native and naturalized communities	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	Possible	Moderate	Intermediate	Det treatr weed
Botany / Weeds	Resources	Ruckel Ridge-Native and naturalized communities	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	likely	moderate	High	Det treatr weed
Botany / Weeds	Resources	Pacific Crest Trail-Native and naturalized communities	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	Unlikely	Moderate	Low	No T
Botany / Weeds	Resources	Eagle Creek-Native and naturalized communities	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	Likely	Major	Very High	Det treatr weed (
		Tanner Creek	Spread of invasive plants				De

Botany / Weeds	Resources	Wahkeena Creek/trailhead- Native and naturalized communities	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	Likely	Moderate	High	Detreat weeds
Botany / Weeds	Resources	Larch Mountain trail at Multnomah Falls- Native and naturalized communities	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	Likely	Moderate	High	Detreat weeds
Botany / Weeds	Resources	Archer Mountain- Native and naturalized communities	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	Possible	Moderate	Intermediate	Detreat weeds
Botany / Weeds	Resources	2820/1310 road systems & vicinity- Native and naturalized communities within Mark O. Hatfield Wilderness	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	Possible	Moderate	Intermediate	Detreat weeds
Botany / Weeds	Resources	Road 777 and BPA right-of way- Native and naturalized communities	Spread of invasive plants into native habitats and loss of habitat and species in moderate to high burn severity.	Likely	Moderate	High	Detreat weeds

B. Emergency Treatment Objectives:

The primary objective of this Burned Area Emergency Response Report is to recommend prompt actions deemed reasonable and necessary to effectively protect, reduce or minimize significant threats to human life and property and prevent unacceptable degradation to natural and cultural resources. The application of these BAER treatments are expected to minimize on-site and downstream damages to the identified values at risk previously mentioned. The emergency treatments being recommended by the Eagle Creek BAER Team are specifically designed to achieve the following results.

Proposed Land Treatments

The objective of the land treatments are to:

1. Promote and protect native and naturalized vegetative recovery by reducing the spread of noxious weeds (L1/ L2).

Proposed Road and Trail Treatments

The objective of the road and trail treatments are to:

1. Protect road and trail investments from becoming impassible and damaged due to increased post-fire runoff. (R1, R2, T1, T2)
2. Reduce sedimentation into streams degrading water quality (R1, R2, T1, T2)
3. Improve road drainage by increasing ditch and catchment basin capacity to reduce the potential for road failure due to increased flows (R1, R2)

Proposed Protection/Safety Treatments:

The objective of the protection/safety treatments are to:

1. Protect human life and safety by raising awareness through posting hazard warning signs at recreation sites, trailheads, and when entering the burn area. (P1, P2, P3, P4,)
2. Coordinate with city, county, state and other agencies to relay critical emergency information for values at risk down stream. (P4)
3. Provide administrative support for special uses on NFS lands that need to occur due to the fire (3 State Fish Hatcheries, Municipal Water Supply Wells, National Weather Service Early Warning Systems, and County Emergency Services) (P4)
4. Coordinate with Bonneville Power Administration to ensure there activities post-fire on NFS lands are in sync with BAER emergency treatments. (P4)
5. On-going need for public information to relay the hazards created by the fire especially rock fall. (P4)
6. Protect worker and public safety by removing hazard trees at trailheads and within the vicinity of road and trail work. (HT)
7. Protection of property and are of National Historic Significance at Multnomah Falls/ Lodge. (P6-P-10)

Proposed Channel Treatments:

There are no proposed channel treatments.

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

Land NA (only weeds) % Channel NA % Roads/Trails 75 % Protection/Safety 85 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	70	75	80
Channel	NA	NA	NA
Roads/Trails	90	90	90
Protection/Safety	85	90	95

E. Cost of No-Action (Including Loss): Critical values identified in Section A would be damaged or lost. Cost of the no action is estimated to be **\$2,790,000***

F. Cost of Selected Alternative (Including Loss): Total cost of the action alternative (including loss) is **\$260,498* (Cost is only for treatments with monetary value)**

*VAR Spreadsheet justified treatments. Only values that could be assigned a monetary value were considered, consult VAR spreadsheet.

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input checked="" type="checkbox"/> Geology	<input type="checkbox"/> Range	<input checked="" type="checkbox"/> Recreation
<input type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input checked="" type="checkbox"/> Public Information
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany/Invasives	<input checked="" type="checkbox"/> Archaeology	<input checked="" type="checkbox"/> Hydrology
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

Team Leaders: Liz Schnackenberg – South Zone Hydrologist, Medicine Bow-Routt National Forest
Kyle Wright – Assistant Team Leader – Zone Hydrologist, Deschutes National Forest

Email: lschnackenberg@fs.fed.us **Phone:** 970-870-2234
kylewright@fs.fed.us 458-292-6027

Team Members:

John Rihs–Hydrologist	Patrick McGervey- Recreation
Diane Hopster–Hydrologist	Joe Welke- Recreation
Mark Kreiter–Hydrologist	Paul Claeysens- Archaeology
Ryan Cole – Engineering Geologist	Judith Downing- PIO
Hannah Grist- Forest Geologist	Mary Huels- PIO
Eric Nicita – Soil Scientist	Guillermo Sereno- Safety
Sarah Hash – Soil Scientist	JD Jones- Fisheries
Melissa Waid – Soil Scientist	Carina Rosterolla - GIS/ Wildlife
Kipp Klein- Engineering	Jess Clark- GIS
Josh Marr- Engineering	
Sarah Callaghan- Invasive Plants/Botany	

H. Treatment Narrative:

Land Treatments:

L1 - Invasive Weed Detection and Treatment: Invasive plant detection and treatment along the Forest Service trails and drainages, that were of high to moderate burn severity and where non-native invasive plants are absent or present in small amounts, will be necessary to prevent spread and dispersal of non-native invasive plants into newly burned and disturbed areas. Detection and treatment will also occur along select FS roads that intersect Bonneville Power Administration Right-of-Way and roads adjacent to the Mark O. Hatfield Wilderness. Although moderate burned areas may have some intact vegetation or may experience needle fall, it is not sufficient to prohibit the spread and establishment of invasive plants. Key species that will be targeted for survey and control, such as false brome and garlic mustard, are able to survive, establish and spread exponentially in low severity burned areas. The focus will be on locations adjacent to known weed sites, where fire suppression may have introduced invasive plants and road systems that have been previously disturbed and will have a greater potential for invasive plants to establish. The road and trail systems are primary vectors

for weed spread and Early Detection/Rapid Response (EDRR) will allow treatments to occur before these species are able to spread.

EDRR will occur on approximately 200 acres and estimated invasive plant treatments to occur across 30 acres. **Total request is for \$19,250.**

Locations: 1) Trails and drainages-Wyeth, Eagle, Ruckel, Tanner, Oneonta, Wahkeena, Larch Mountain and Multnomah; 2) FSR 2820, 2810, 777 & associated BPA ROW; 3) Archer Mountain-west side.

Treatment	Units	Unit Cost	# of Units	Total Cost
Invasive Plant Surveys/detection	Acres	\$29.50	200	\$5,900
Invasive Plant treatments	Acres	\$445.00	30	\$13,350

L2- Seeding: Native seeding along two high use Forest Service trails (Eagle Creek and Tanner Creek) and one location within the BPA right-of-way where highly invasive plants such as false brome and garlic mustard have been documented and will be targeted for EDRR treatments. Native seeding will increase resiliency and prevent consecutive invasions of these species. False brome has shown to increase exponentially in low to moderately burned areas where these seeding treatments will occur. **Total request is for \$3,685.**

Treatment	Units	Unit Cost	# of Units	Total Cost
Native Plant Seeding	Acres	\$335	11	\$3,685

Road and Trail Treatments:

R1 – Storm Proofing and road stabilization: Storm proof drainage features where identified. Activity will include cleaning culverts and increasing ditch and catchment basin capacity where they exist and installing additional water bars as necessary to handle post-fire flows, sediment and debris. Remove three culverts and replace with low water crossings. Install low water crossings at two other crossings presently without culverts. Installation of additional drainage features (i.e rolling dips) will provide increased capacity and reduce risk from fillslope erosion and downcutting to the road infrastructure. **Total request is for \$29,618.**

Treatment	Unit	Unit Cost	# of Units	Total Item Cost
FS Road 1520129				
Rolling Dip	EA	\$500	5	\$2,500
Armored Rolling Dip	EA	\$3,900	2	\$7,800
Storm Proofing	MI	\$750	1.25	\$938
Out slope Road Prism	MI	\$1,200	0.65	\$780
FS Road 8400777				
Culvert Removal	EA	\$4,200	3	\$12,600
Equipment Mobilization (both roads)				\$5,000

R2- Storm Patrol: Storm inspection/response will keep culvert and drainage features functional by cleaning sediment and debris from in and around features between or during storms. This work will be accomplished through Forest Service Road Crew, equipment rental, and general labor.

Locations: 1) FSR 1520129, 8400777

Treatment	Units	Unit Cost	# of Units	Total Cost
Storm Patrol	Days	\$1,100	20	\$22,000

HT - Hazard Tree Mitigation - This treatment would remove standing danger/hazard trees that are identified as having an imminent failure potential and are likely to damage values within the potential failure zone of the tree as identified in the Field Guide for Danger-tree Identification and Response along Forest Roads and Work Sites in Oregon and Washington. Values at risk of damage from falling danger/hazard trees include permanent infrastructure at recreation sites and fish hatchery improvements. Locations for the treatments are the identified areas adjacent to where people congregate on NFS lands and sites where there will be stationary workers accomplishing BAER treatments on NFS lands. In cooperation with partner agencies, additionally, funding is requested to mitigate some danger trees on NFS lands that have the potential to affect life and safety of users on high-use roadways below NFS lands (I-84 and the Historic Columbia River Highway), but this treatment is limited in extent by BAER policy, and should not be construed as a comprehensive removal of such hazards. **Hazard trees located above and beyond proposed scaling areas need to be removed prior to operations for worker safety. Detailed slope reconnaissance was not feasible during the BAER assessment due to time constraints and safety concerns. Further review by a Forest Service pathologist has identified additional trees to those recommended for removal by the BAER Assessment Team. Due to slope geometry in the vicinity of Multnomah Falls Lodge the complexity of hazard tree mitigation is higher and more costly than originally estimated.**

Total Request is for \$29,000. ~~Total Interim #2 Request is \$67,000 (increase of \$38,000)~~

Treatment	Units	Unit Cost	# of Units	Total Cost
Eagle Creek Trailhead Tree Removal	Days of Work	\$2000	0.5	\$1,000
Eagle Creek Campground Tree Removal	Days of Work	\$2,000	0.5	\$1,000
Eagle Creek Hatchery Intake Hazard Tree Removal	Days of Work	\$2,000	0.5	\$1,000
Eagle Creek Springs Infrastructure Hazard Tree Removal	Days of Work	\$2,000	1	\$2,000
Multnomah Falls Hazard Tree Removal	Days of Work Single Tree	\$2,000 \$400	4 100	\$2,000 \$40,000
Tanner Creek Hatchery Intake Hazard Tree Removal	Days of Work	\$2,000	1	\$2,000
Road Hazard Tree Mitigation on Shell rock Mountain along US Interstate 84	Days of Work	\$2,000	2	\$4,000
Road Hazard Tree Clearing on Historic Columbia River Highway from Waken Falls to US Interstate 84	Days of Work	\$2,000	8	\$16,000
Total Hazard Tree Mitigation				\$29,000 \$67,000

T 1- Trail Stabilization - Work will include the installation of drainage features (outsloping, rolling grade dips, knicks, water bars) and snagging trees as appropriate for worker safety. This work is necessary to protect the trail asset by diverting anticipated increases in surface runoff off the trail. The need for stabilization on trails in low severity areas is based on the fact that most vegetated talus slopes in the gorge are now over steepened due to fire removing cohesive cover. Remote sensing equipment did not catch understory burning where crown cover remains. This request also includes felling of hazard trees along the portion of trail to be worked on in order to mitigate safety concerns. See map for specific locations of trail segments to be worked on.

Total request is for \$201,880.

Treatment	Units	# of Units	Unit Cost	Total Cost
T1a -Trails in Moderate/High Severity Burn on Side Slopes >50%	Miles	15.58	\$7,000	\$109,060
T1b -Trails in Low Severity Burn on Side Slopes >50%	Miles	17.68	\$5,250	\$92,820

T2 - Eagle Creek Suspension Bridge Removal - The removal of the cables, bridge decking, and hand rail on the Eagle Creek Suspension bridge. This work will protect the existing bridge assets (towers and abutments) and also keep compromised bridge materials from contributing to a debris jam in Eagle Creek. Destroyed or unusable material shall be disposed of. Salvageable material shall be saved for future bridge reconstruction. **Total request is for \$30,077.**

Treatment	Units	# of Units	Unit Cost	Total Cost
Removal of bridge cable, decking and handrail	Project	1	\$30,077	\$30,077

Protection/Safety Treatments:

P1 – Road Hazard Warning Signs and Gates

This treatment will design and install burned area warning signs to caution forest visitors recreating and administrative users about the potential hazards that exist within the burned area.. It is consistent with the language provided in the BAER Treatments Catalog. The warning signs will identify the types of hazards to watch for roads, trails, and campgrounds. This treatment will place closure signs, hazard warning signs and information signs at developed campgrounds, key entry points or trail junctions, and numerous recreation trailheads. It will inform users of the dangers associated with entering/recreating within a burned area as well as inform them of closures to help ensure that users are able to access available routes in a safe manner.

The purchase and installation of signs at each of the identified locations consistent with Forest Engineering Standards at these locations. A Forest Service employee will inspect the signs for visibility, damage, or loss and replace as needed. A Forest Service employee shall also monitor the closure to make sure it is effective, and see if any deficiencies in the closure need to be corrected. This treatment will keep Forest users out of the burn area during major storm events and inform users of the dangers associated with entering/driving within a burned area.

Installation of BAER Road Warning Signs and Gates	QTY	Rate	Method	UOM	Total
Mobilization	1	\$1,200.00	Lump	Lump	\$1,200.00
Signs, Aluminum Panels and Posts	5	\$450.00	AQ	Each	\$2,250.00
Gates, Post and Hardware, Type III	3	\$1,000.00	AQ	Each	\$3,000.00
Hazard Signs for 840077, 1520129	24	\$1,531.00	Lump	Lump	\$1,531.00
Treatment Total					\$7,981.00

P2 - Trail Hazard Signs: Signs will inform users of the danger associated with entering and using trails and dispersed recreation areas within the burned area. The installation of trail signs include posts and associated hardware. There are a large number of portals or access points to these trails and require a relatively high number of signs on both the Hood River Ranger District and the Columbia River Gorge National Scenic Area, locations are shown on the treatment map. **Total request is for \$13,900.**

Initial request for \$15,000 was approved for Trail Closure Signs, current request is in addition to.

Treatment	Units	Unit Cost	# of Units	Total Cost
Trail Warning Signs	Sign/Post	\$125	60	\$7,500
Sign Post and Hardware	Sign/Post	\$40	60	\$2,400
Labor for Installation	Days	\$200	20	\$4,000

P3 - Emergency Closure Area Enforcement: Provide qualified law enforcement to enforce emergency area closures for public safety in areas of the burned area. Law enforcement includes extra Forest Protection Officer Staffing and a Law Enforcement Officer. The burned area is extremely dangerous and has many hazards including falling hazard trees and rock fall from extremely steep slopes. It is necessary to ensure that visitors do not enter this dangerous area. The area normally sees over 4 Million visitors annually and there are over 50 different entry portals into the burned area. Annually more than a million visitors travel over 200 miles from their homes to visit the area, making education about the hazards and closure very difficult primarily through signage and media. Over 100 incursions into the Closure Area have already been observed in the first 30 days of the closure and local experience shows that physical barriers have minimal success to foot traffic, while 17+ road guards were in place during the incident. To minimize visitors entering the closure area, it is necessary to have on the ground enforcement. Forest Protection Officers will be Forest employees hired temporarily and the Law Enforcement Officer will be additional Forest employee detailed temporarily and includes per diem. Cost will include 5 Forest Protection Officers for the National Scenic Area throughout the year, 1 Forest Protection Officer for the Hood River Ranger District half a year, and 1 Law Enforcement Officer for four months during peak visitation. **Total request is \$176,170.**

Treatment	Units	Unit Cost	# of Units	Total Cost
Forest Protection Officers (6)	Days	\$150	780	\$117,000
Law Enforcement Officer (Detail)	Days	\$350	120	\$42,000
Law Enforcement Per Diem	Days	\$145	120	\$17,160

P4- Interagency Coordination: Continued distribution of public information is considered essential for public safety in conveying the risk within the burn. Ongoing interagency coordination for distributing public information is critical for coordinating public information for the Eagle Creek Fire is considered essential for keeping city, county, state, and other agencies informed and relaying the BAER assessment findings, particularly with Oregon Department of Transportation (Interstate Highway 84, Historic Highway 30) City of Cascades Locks Public Works (i.e. back-up Municipal Water Supply), Bonneville Power Administration (BPA Powerlines going through the fire), Oregon Department of Fish and Wildlife, Oregon State Parks, United States Fish and Wildlife Service, and Natural Resources Conservation Service (NRCS). Other coordination is included for special use permitting with potential projects funded from Oregon Department of Fish and Wildlife Fish Hatcheries, National Weather Service and Counties. (Includes 10 days for transportation, 5 days for coordination with BPA, 15 days for aquatics/ fisheries, 5 days of Section 106 and Tribal Consultation, 30 days for Public Information and 10 days for botany). **Total request in \$30,000.**

Treatment	Units	Unit Cost	# of Units	Total Cost
Interagency Coordination	Days	\$400	75	\$30,000

P5 - Eagle Creek Trailhead Restroom Protection: Construct a simple rock catchment behind the restroom at Eagle Creek Trailhead to protect restroom building destruction from rock fall. Work will be completed by Forest Service Road Crew to excavate a rock catchment behind the structure to catch rock fall. **Total request is \$1,310.**

Treatment	Units	Unit Cost	# of Units	Total Cost
Restroom Rock Catchment Excavation	Days	\$1310	1	\$1,310

P6- Multnomah Falls Parking Area Rock Scaling: Increased rock fall and rockslides have already begun occurring in the parking areas adjacent to Highway 30. Rock scaling along the near vertical cliff faces is required to reduce the risk of damage to the Historic Columbia River Highway, vehicle traffic, and pedestrian traffic at this busy location. **Detailed slope reconnaissance was not feasible during the BAER assessment due to time constraints and safety concerns. More recent, detailed slope analysis indicates additional rockfall pathways to Multnomah Falls Lodge. Additionally, site visits with rockfall mitigation experts indicated that additional work will be required to safely conduct emergency response operations at the project site. Altogether, rock scaling required in the vicinity of Multnomah Falls Lodge is more extensive than originally identified during BAER Assessment and includes work required for worker safety, in part due to the fact that the Forest Service has not previously awarded a contract like this.**

Total request is \$17,304. New Total Request is \$160,000 (increase of \$142,696).

Treatment	Units	Unit Cost	# of Units	Total Cost
Rock Scaling	Project	\$17,304	4	\$17,304
		\$160,000	1	\$160,000

P7- Multnomah Falls Trail Rock Fall Fencing: The existing rock fall catchment fence along the paved trail from the lodge to Benson Bridge needs to be improved in order to protect the historic viewing pavilion below, and preserve the Forest Service investment in the rock fall fence. The existing fence has been impacted by large rocks and trees since the fire burned the cliffs above causing its strength to be compromised. In its current state the fence is unlikely to survive the predicted increase in material falling into the fence, necessitating immediate treatment to prevent damage to the viewing pavilion. **Close inspection of the existing fence indicated the fence is in worse shape than previously thought. In addition, removal of existing material in rock fall fencing must be completely removed prior to reinforcement of the structure, adding a significant additional cost.**

Total request is \$76,800. New total request is \$257,000 (increase of \$180,200).

Treatment	Units	Unit Cost	# of Units	Total Cost
High Impact Rock Fence Repair	Project	\$76,800	4	\$76,800
		\$257,000	1	\$257,000

P8- Multnomah Falls Lodge Protection from Rock Fall: A catchment fence is required to mitigate the impact of rock fall to critical values located at the Multnomah Falls Lodge. Increased rock fall from the cliffs and talus slope above the Lodge is very likely to occur as a result of lost cohesive cover on the slopes above. A low impact rock fence is needed to prevent direct rock fall impact to the Lodge as well as rockslide from the over-steepened alluvial fan directly above the Lodge. **Detailed slope reconnaissance identified a chute on the west end of lodge not initially identified in the BAER Assessment. The chute funnels rockfall between two basalt outcrops that terminate at the southeast corner of the Lodge. Based on favorable slope geometry, the new rockfall fence can be extended to cross the chute, thus mitigating the rockfall hazard and reducing risk.**

Total request is \$91,200. New total request is \$152,625 (increase of \$61,425).

Treatment	Units	Unit Cost	# of Units	Total Cost
Low Impact Rock Fence Construction	Project	\$91,200	1	\$91,200
		\$152,625	1	\$152,625

P9- Historic Columbia River Highway Parking Barricades: Rock fall from the steep, burned, unstable cliffs above the west parking area at Multnomah Falls and Oneonta Gorge will likely occur due to post-fire effects. To mitigate damage to the Historic Columbia River Highway and vehicles parked at the site a boulder barricade needs to be installed to prevent parking on the south side of the highway. **Total request is for \$23,760.**

Treatment	Units	Unit Cost	# of Units	Total Cost
Multnomah Falls Parking Barricade	Project	\$13,320	1	\$13,320
Oneonta Gorge Parking Barricade	Project	\$10,440	1	\$10,440

P10 - Multnomah Falls Viewing Area Historic Rockwall Stabilization - This work entails the stabilization of the historic rock retaining wall above the switchback of the paved path. A breach has formed in the wall due to rock fall from above. Stabilizing this breach will prevent further collapse of this historic feature. **Total request is for \$10,925.**

Treatment	Units	# of Units	Unit Cost	Total Cost
Stabilization of historic retaining wall	Project	1	\$10,925	\$10,925

Implementation Team/ Safety:

I1- Implementation Team Lead- Person in charge of insuring work get done in a timely manner to reduce risks to BAER values. **Total request is for \$12,000.**

Treatment	Units	# of Units	Unit Cost	Total Cost
Implementation Team Lead	Days	30	\$400	\$12,000

I2- Implementation Team Safety Officer- This unique position help to minimize the risk to the personnel implementing BAER funded project. This would include a deliberate risk assessment of BAER activities especially trail stabilization work. **Total request is for \$8,000.**

Treatment	Units	# of Units	Unit Cost	Total Cost
Implementation Team Safety Officer	Days	20	\$400	\$8,000

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #2

Line Items	Units	NFS Lands			Other \$
		Unit Cost	# of Units	BAER \$	
A. Land Treatments(L)					
L1-Invasive Survey/ Detection	acres	\$29.50	200	\$5,900	\$0
L1-Invasive Plant Treatment	acres	\$445	30	\$13,350	\$0
L2- Seeding	acres	\$335	11	\$3,685	\$0
<i>Subtotal Land Treatments</i>				<i>\$22,935</i>	<i>\$0</i>
B. Channel Treatments					
No Treatments Recommended		\$0	0	\$0	\$0
<i>Subtotal Channel Treat.</i>				<i>\$0</i>	<i>\$0</i>
C. Road/Trails (R-T)					
R1 - Storm Proofing/ Sabilization (1520-129)	Mile	\$904	1.9	\$1,718	\$0
R1- Install Drainage Features (1520-129)	Dip Install	\$1,471	7	\$10,300	\$0
R1- Low Water Crossing (8400-777)	Crossing	\$5,867	3	\$17,600.01	\$0
R2- Storm Patrol	Day	\$1,100	20	\$22,000	\$0
T1-Trail Stabilization	Miles	\$6,070	33.26	\$201,880	\$0
T2-Eagle Creek Suspension Bridge Removal	Project	\$30,077	1	\$30,077	\$0
<i>Subtotal Road & Trails</i>				<i>\$283,574</i>	<i>\$0</i>
D. Protection/Safety (R-P)					
HT- Hazard Tree Mitigation	Days	\$2,000	14.5	\$29,000	\$0
<i>Additional Hazard Tree Mitigation - Multnomah Falls</i>	<i>Lump</i>	<i>\$38,000</i>	<i>1</i>	<i>\$38,000</i>	<i>\$0</i>
<i>Initial signs</i>	<i>Lump</i>	<i>\$15,000</i>	<i>1</i>	<i>\$15,000</i>	<i>\$0</i>
P1- Road Hazard Signs and Gates	Lump	\$7,981	1	\$7,981	\$0
P2- Trail Hazard Signs	Sign/ Post	\$232	60	\$13,900	\$0
P3- Emergency Closure Area Enforcement	Lump	\$176,170	1	\$176,170	\$0
P4- Interagency Coordination	Days	\$400	75	\$30,000	\$0
P5- Eagle Creek Restroom Protection	Lump	\$1,310	1	\$1,310	\$0
P6- Multnomah Falls Parking Rock Scaling	Project	\$17,304	1	\$17,304	\$0
<i>Additional rock scaling</i>	<i>Project</i>	<i>\$142,696</i>	<i>1</i>	<i>\$142,696</i>	<i>\$0</i>
P7- Multnomah Falls Trail Rock Fall Fence	Project	\$76,800	1	\$76,800	\$0
<i>Additional trail rock fence</i>	<i>Project</i>	<i>\$180,200</i>	<i>1</i>	<i>\$180,200</i>	<i>\$0</i>
P8- Multnomah Falls Lodge Protection Rock Fall	Project	\$91,200	1	\$91,200	\$0
<i>Additional Lodge protection fence</i>	<i>Project</i>	<i>\$61,425</i>	<i>1</i>	<i>\$61,425</i>	<i>\$0</i>
P9- Parking Barricades	Project	\$23,760	1	\$23,760	\$0
P10- Multnomah Falls Historic Rockwall Stabilization	Project	\$10,925	1	\$10,925	\$0
<i>Subtotal Structures</i>				<i>\$739,501</i>	<i>\$0</i>
Implementation Team					
I1- Implementation Team Leader	Days	\$400	30	\$12,000	\$0
I2- Implementation Safety Officer	Days	\$400	20	\$8,000	\$0
<i>Subtotal Structures</i>				<i>\$20,000</i>	<i>\$0</i>
E. BAER Evaluation					
Eagle Creek BAER				\$160,000	\$0
F. Monitoring (M)					
Closure Effectiveness Monitoring	Lump	\$20,000	1	\$20,000	\$0
<i>Subtotal Monitoring</i>				<i>\$20,000</i>	<i>\$0</i>
G. Totals					
Previously approved				\$663,690	
Total for this request				<i>\$422,321</i>	
Total Requested				\$1,086,011	

PART VII - APPROVALS

1. /s/ Lynn Burditt
Forest Supervisor (signature)

November 2, 2017
Date

2. _____
Regional Forester (signature)

Date