

Date of Report: September 20, 2017

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

- ☒ 1. Funding request for estimated WFSU-SULT funds
- ☐ 2. Accomplishment Report
- ☐ 3. No Treatment Recommendation

**B. Type of Action**

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)
- ☐ 2. Interim Report
  - ☐ 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: Fall Creek (Part of Umpqua North Complex)
- B. Fire Number: OR-UPF-000406
- C. State: Oregon
- D. County: Douglas
- E. Region: 6
- F. Forest: Umpqua
- G. District (s): North Umpqua RD
- H. Fire Incident Job Code: P6K9FS17 (0615)
- I. Date Fire Started: August 11<sup>th</sup>, 2017
- J. Date Fire Contained: Fall Creek 9/9/2017- Umpqua North Complex 38% contained as of 9/17/2017.
- K. Suppression Cost: \$28M (as of 9/9/2017)
- L. Fire Suppression Damages Repaired with Suppression Funds
  - 1. Handline waterbarred and slashed (miles): 1.6
  - 2. Dozer line waterbarred and slashed (miles): 2.5
  - 3. Fireline seeded (miles): NA
  - 4. Other (identify): Road containment lines 23.7
- M. Watershed Number: 1710030108 Middle North Umpqua River
- N. Total Acres Burned: 4,818
  - NFS Acres (4,759)
  - Other Federal (49)
  - Private (10)
- O. Vegetation Types: The dominate vegetation type within the Fall Creek fire perimeter is within the Western hemlock, white fir/grand fir, douglas-fir zones. Understory composition is primarily vine maple, rhododendron, salal and Oregon grape with sword fern in moister sites. Hardwoods including big leaf maple and red alder in riparian areas. Scattered madrone and Oregon white oak occur in patches on well drained south facing slopes along with chinkapin.

P. Dominant Soils: Loam and sandy loam

Q. Geologic Types: Predominantly basalts, andesites, and tuffaceous material.

R. Miles of Stream Channels by Order or Class: Class 1 - 1.1 mi; Class 2 - 0.5 mi; Class 3 – 15.3 mi; Class 4 - 17.5 mi

S. Transportation System

Trails: Non-motorized – approximately 5 miles

Roads:

Maintenance Level	Total Length of Roads
2 - High Clearance Vehicles	29.29 mi
1 - Basic Custodial Care (Closed)	0.95 mi
Roads Designated as Motorized Trails, OHV <=50"	1.70 mi
<b>Total</b>	<b>31.94 mi</b>

### **PART III - WATERSHED CONDITION**

A. Burn Severity (acres):

N/A\* (Unburned) 4825 (low) 119(moderate) 0 (high) \*due to the absence of a BARC map unburned acres were combined with low burn severity acres

B. Water-Repellent Soil (acres): There was no observed water repellency in the burned area.

C. Soil Erosion Hazard Rating (percent):

33% (low) 56% (moderate) 11% (high) 0% (very high)

D. Erosion Potential: 0.5 tons/acre

E. Sediment Potential: 250 cubic yards / square mile

### **PART IV - HYDROLOGIC DESIGN FACTORS**

A. Estimated Vegetative Recovery Period (years): 2-3 years

B. Design Chance of Success (percent): 90

C. Equivalent Design Recurrence Interval (years): 5

D. Design Storm Duration, (hours): 24

E. Design Storm Magnitude (inches): 4.1

F. Design Flow (cubic feet / second/ square mile): 195

G. Estimated Reduction in Infiltration (percent): 12

H. Adjusted Design Flow (cfs per square mile): 218

## **PART V - SUMMARY OF ANALYSIS**

### A. Describe Watershed Emergency:

Emergency is determined using the Risk Assessment Matrix below. Values at risk that are at High to Very High Risk are considered to be at unacceptable risk of post-fire effects and warrant treatment. Values at Risk for the Fall Creek Fire are summarized in the VAR Table (Table 1).

### **Critical Values to be Considered During Burned-Area Response (BAER)**

<b>HUMAN LIFE AND SAFETY</b>	
Human life and safety <i>on National Forest System (NFS) lands.</i>	
<b>PROPERTY</b>	
Buildings, water systems, utility systems, road and trail prisms, dams, wells or other significant investments <i>on NFS lands.</i>	
<b>NATURAL RESOURCES</b>	
Water used for municipal, domestic, hydropower, or agricultural supply or waters with special Federal or State designations <i>on NFS lands.</i>	
Soil productivity and hydrologic function <i>on NFS lands.</i>	
<i>Critical habitat or suitable occupied habitat for federally listed threatened or endangered terrestrial, aquatic animal, or plant species on NFS lands.</i>	
Native or naturalized communities on NFS lands <i>where invasive species or noxious weeds are absent or present in only minor amounts.</i>	
<b>CULTURAL AND HERITAGE RESOURCES</b>	
Cultural resources which are <i>listed on or potentially eligible</i> for the National Register of Historic Places, <i>Traditional Cultural Properties, or Indian Sacred Sites</i> on NFS lands.	

### **BAER Risk Assessment**

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

**Probability of Damage or Loss:** The following descriptions provide a framework to estimate the relative probability that damage or loss would occur within 1 to 3 years (depending on the resource):

- **Very likely** - Nearly certain occurrence (90% - 100%)
- **Likely** - Likely occurrence (50% - 90%)
- **Possible** - Possible occurrence (10% - 49%)
- **Unlikely** - Unlikely occurrence (0% - 9%)

**Magnitude of Consequences:**

- **Major** - Loss of life or injury to humans; substantial property damage; irreversible damage to critical natural or cultural resources.
- **Moderate** - Injury or illness to humans; moderate property damage; damage to critical natural or cultural resources resulting in considerable or long term effects.
- **Minor** - 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.

**Table 1. Values at Risk Analysis for the Fall Creek Fire**

BAER Critical Value		Threat	Probability of Damage or Loss	Magnitude of Consequences	Risk	Recommended Treatments
Human Life & Safety		People on open roads	Fallen trees, snags, rocks	<i>Likely (50% - 89%)</i>	Major	Very High Install hazard signs, emergency roads closures
Human Life & Safety		People on trails	Snags, loss of trail tread, trail not visible, wash outs	Possible (10% - 49%)	Major	High Winter trail closure and install hazard signs at trailheads and raft put-ins
Property		Developed Hiking Trails - Tioga Section of the North Umpqua National Recreation Trail- approx. 5 miles	High runoff event likely to cause loss of trail tread and forest investment in trail construction and maintenance	<i>Likely (50% - 89%)</i>	Moderate	High Trail storm proofing and waterbars focused on areas of highest concern
Property		Roads- 29 miles level 2 roads	Road failure due to increased runoff by culvert plugging and flow rerouting down roads	<i>Likely (50% - 89%)</i>	Moderate	High Road storm patrol and response focused on areas of highest concern
Natural Resources		Soil Productivity - moderate and high soil burn severity	Accelerated erosion and debris flow	Possible (10% - 49%)	Minor	Low None recommended
Natural Resources		TES Critical Habitat	Loss of high quality habitat for Northern Spotted Owl and Coho Salmon	Possible (10%-30%)	Moderate	Intermediate None for NSO. Trail and road treatment for Coho
Natural Resources		Invasives - primarily meadow knapweed, Himalayan blackberry, Canada thistle, Scotch broom, tansy ragwort	Expansion of currently isolated invasive populations along the major roads and trails in the burned area	<i>Very Likely (90% - 100%)</i>	Moderate	Very High Weed detection and treatment
Natural Resources		Watershed - Hydrologic function and Aquatic Habitats	Loss of soils from post-fire erosion with flashier hydrologic response and subsequent degradation to Aquatic Habitats	<i>Likely (50% - 89%)</i>	Minor	Low Road and trail treatment
Cultural & Heritage Resources		Treatment Implementation - surface and subsurface features	Loss of scientific data present in the archaeological deposits at the work sites during BAER treatments	Unlikely (0% - 9%)	Minor	Very Low Equipment use and other ground disturbing treatment activities needs to be cleared by Archeologist prior to implementation

## **Human Life and Safety**

Threats to human life and safety exist throughout the burned area. Fire killed trees in the burned area pose an immediate threat to the public. Many trees have already fallen, and it likely that many more will continue to fall, especially during winter storm events.

There is an immediate and future threat to travelers along the roads within the burned area due to the increased potential for rolling and falling rock from burned slopes above roads and increased potential for debris flow. With the loss of vegetation normal storm frequencies and magnitudes can more easily initiate erosion on the slopes and it is possible that this runoff will cover the roads or cause washouts at drainage facilities (culverts) or stream crossings. These events make for hazardous access to forest roads and put the safety of users at risk.

The fire burned across the Tioga section of the North Umpqua Trail (NUT), approximately 5 miles. This section is 8 miles long with no options for ingress/egress except the trailhead at each end of the section. The North Umpqua Trail (NUT) is very popular with hikers, mountain bikers and fishermen year around. The NUT crosses drainages through areas where soil burn severity was low to moderate. These areas have trees, which will become snags and pose a degree of hazard to trail users. Approximately 50' of boardwalk burned, and numerous locations are impacted by sluffing, slides onto the trail, and collapse of trail due to burned roots under the trail.

The probability of damage or loss to values at risk of human life and safety is considered to be possible, and the magnitude of consequence major, therefore the risk is deemed to be high. Significance of protecting human life and safety is self-evident, and is justification enough for proposed treatments to mitigate or minimize the hazards.

## **Property – Roads, Trails, Infrastructure**

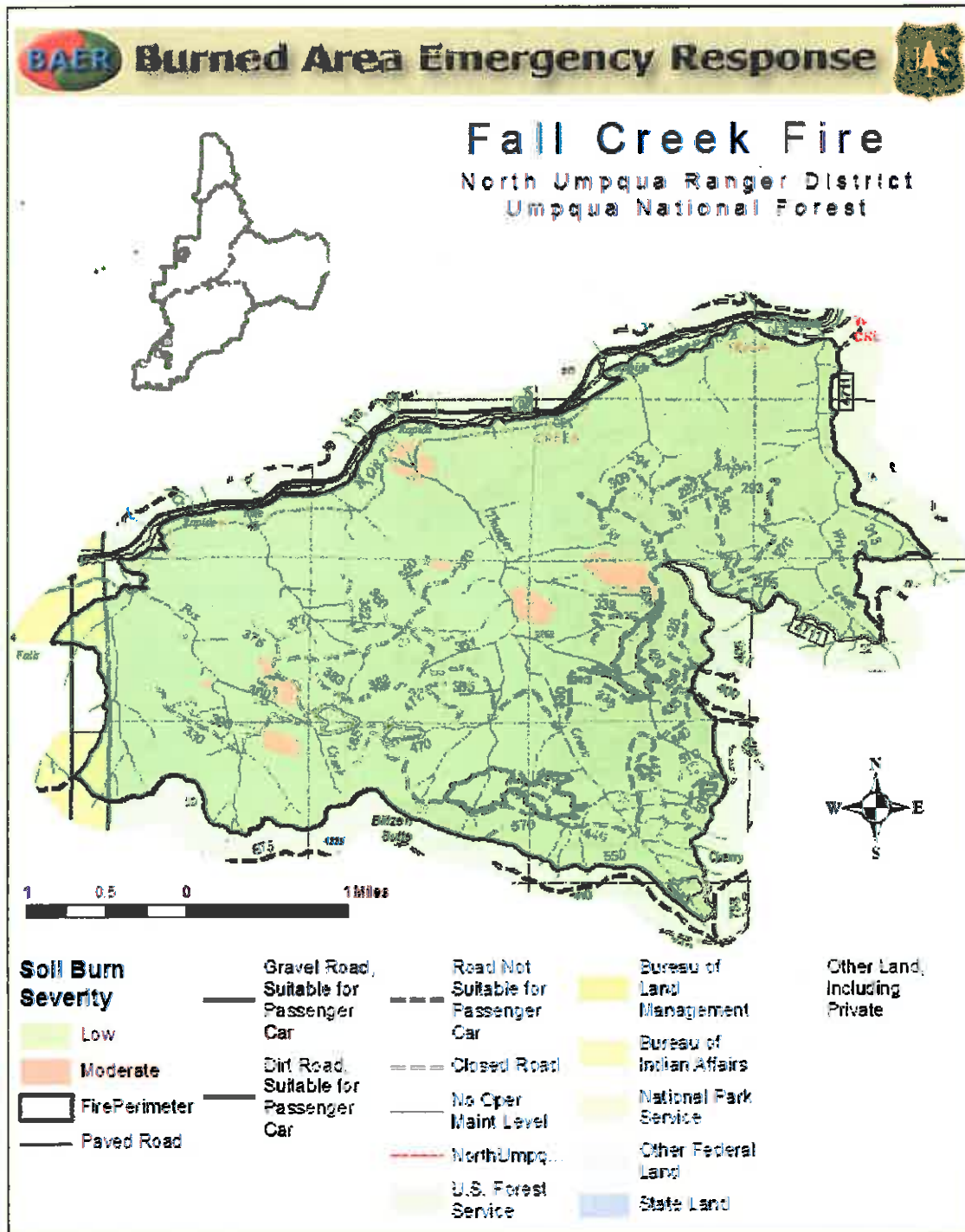
**Roads-** Roads within the Fall Creek Fire contain drainage structures that cross streams located in watersheds that have a moderate to low burn severity. Existing landslide and slope stability mapping, as well as field reviews from soil scientists and engineers, indicate that the Fall Creek fire area is prone to landslides and debris flows. Even with low and moderate soil burn severity, the streams in the fire area now have the potential for increased runoff and debris flows. These increases in flows pose a threat to the existing crossings which may result in plugging drainage structures or exceeding their maximum flow capacity. If these flows plug drainage structures the result could be erosion and debris torrents further down the drainage due to the failure. Storm inspection/response keeps culvert and drainage structures functional by cleaning sediment and debris from the inlet between or during storms. This work will be accomplished through Forest Service Road Crew, equipment rental, and general labor.

**Trails-** There are 5 miles of the NUT that are within low to moderate burn severity. Because the trail is at the bottom of steep slopes and crosses several drainages, it is threatened by high runoff events that could cause loss of trail tread and obliteration of the existing trail. Probability of damage or loss is likely and the consequence is moderate due to impacts to the trail investment and impacts to Coho critical habitat in the North Umpqua River. The trail is heavily used by fishing and mountain bike outfitter/guide companies, is a major draw to the area and an important piece of recreation tourism in the area.

## **Natural Resources**

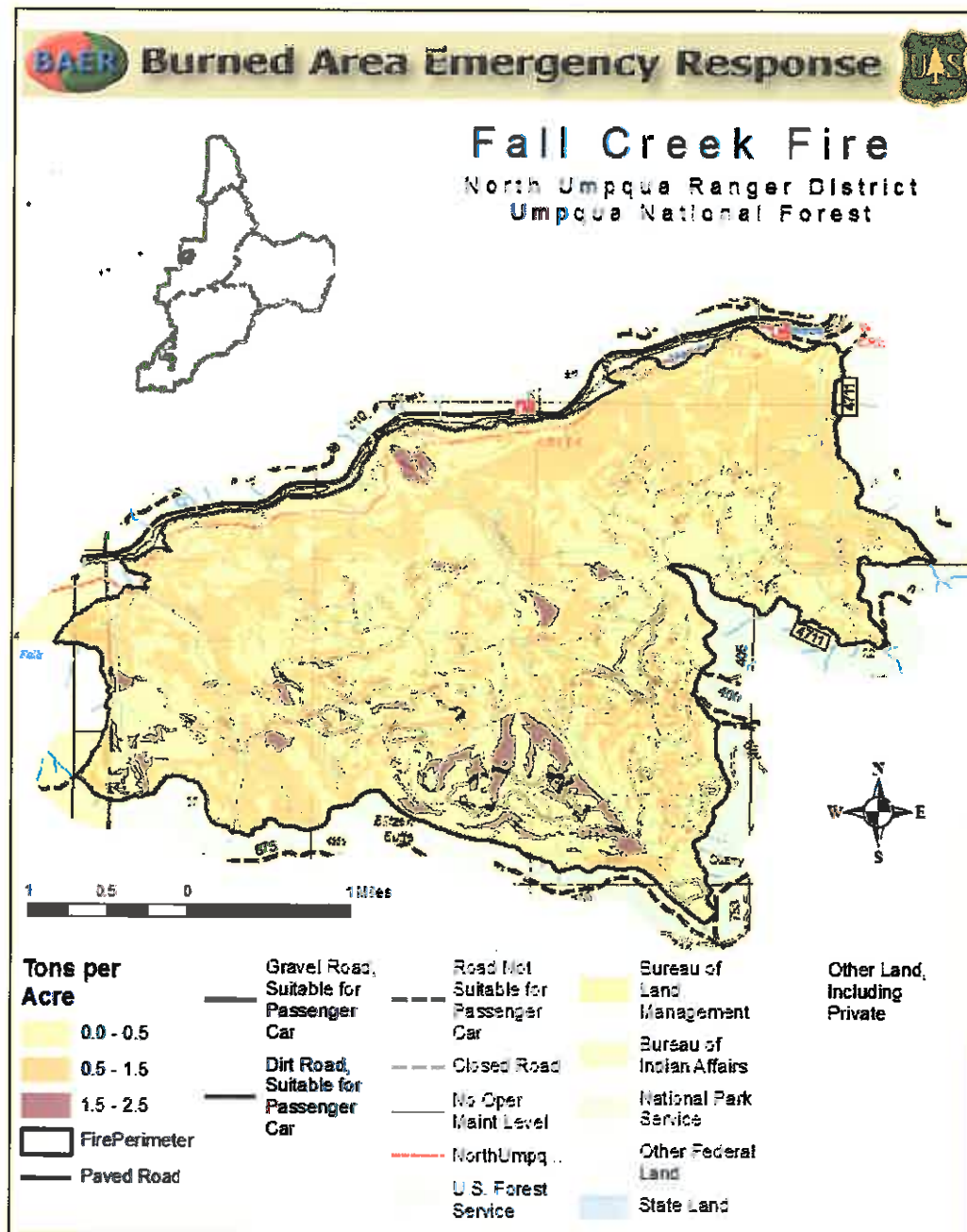
**Soil Productivity-** Approximately 2% (119 acres) of land within the fire perimeter is considered to have moderate soil burn severity (Map 1). The threat within moderate severity burn areas is accelerated erosion and debris flow. Modeled erosion rates show small isolated patches on increased erosion in the upper part of the Thunder Creek drainage, and the lower part of the Thunder Creek drainage where Thunder Creek enters the North Umpqua River. (Map 2). This indicates that the probability of damage or loss to soil resources is possible

to likely in 2% of the burned area where burn severity was determined to be moderate. The magnitude however, was determined to be minor at the landscape scale.



Map 1. Soil Burn Severity Map of Fall Creek Fire





Map 2. Erosion Risk Index Map of the Fall Creek Fire

Critical habitat or suitable occupied habitat for federally listed threatened or endangered terrestrial, aquatic animal, or plant species on NFS lands:

#### Northern Spotted Owl

Within the fire perimeter, 2,440 acres of nesting, roosting and foraging (NRF) habitat and 4,664 acres of Critical habitat were impacted. Two 100 acre LSR4 owl cores are within the fire perimeter and one known occupied nest is directly adjacent to the fire edge in the southwest of the fire area. Impacts to spotted owls from fire are largely due to loss of high quality habitat and habitat fragmentation.

The Fall Creek fire burned with mixed severity, with the low to moderate burns across most of the area and very little high. Areas of moderate to high severity burn was mostly isolated to younger and more densely packed stands more typical of dispersal habitat. Fire burned through older stands and consumed most of the



ground fuels and left larger trees largely unburned. Some patches of isolated torching caused canopy mortality and consumption of standing and down deadwood. Although some areas were impacted more than others, overall habitat functionality within the Fall Creek fire was maintained. Beneficial impact from the fire include increased vigor in understory vegetation and hardwood species, recruitment of snags and down wood, and increase in heterogeneity across the landscape.

#### Coho Salmon

The Fall Creek fire burned 4 river miles of coho salmon critical habitat. Most of the areas on the river bank experienced moderate to low fire severity. Impacts to habitat from this fire include increased risk of sediment loads into the North Umpqua River, and increased amounts of downwood over time.

Invasive Plant Species- There are five noxious weed species of main concern in the fall creek fire perimeter: Armenian blackberry (*Rubus armeniacus*), Scotch broom (*Cystisus scoparius*) meadow knapweed (*Centaurea pratensis*) Canada thistle (*Cirsium arvense*) and tansy ragwort (*Senecio jacobaea*). The probability of damage or loss from the introduction and spread of invasive plants is considered to be very likely, and the magnitude of consequences is determined to be moderate, therefore, the risk is very high that invasive plant species will have a negative impact on native plant communities as a result of the fire. Post-fire conditions are particularly favorable to noxious weed establishment in areas where fire consumed the existing native vegetation leaving soil bare for colonization, so treatments are warranted to prevent or minimize their spread. There are small but established populations of Armenian blackberry, Scotch broom, meadow knapweed, Canada thistle, and tansy ragwort occurring primarily along the road prisms which also functioned as firebreaks. Areas where fire burned up to the road and the North Umpqua trail and adjacent to these noxious weed infestations have the highest risk of invasion.

Watershed- Some loss of soil from post-fire erosion is expected, especially during the first winter when maximum bare ground is exposed. Much groundcover was consumed during the fire, but many areas retained residual litter and duff, and substantial amounts of rock. Some needle cast and newly fallen trees also provide groundcover, as well as many scattered areas of unburned vegetation. This reduction in groundcover combined with a slightly flashier hydrologic response will likely result in elevated sedimentation. Elevated flows are also expected to increase the potential for instream erosion (gullyng or debris flow) and floating debris that could compromise hydrologic function and integrity of downstream aquatic habitats, including the North Umpqua River which provides habitat for threatened OC Coho. Modelled hydrologic response from the fire showed 11% and 12% increase in peak flow during a 5-year, 24-hour design storm. The magnitude of these impacts will be relatively minor given the small amount of moderate, and no high soil burn severity. Stream bank vegetation has burned in many areas, but is intact in the many unburned islands and where moister conditions dampened fire activity. Most large channel wood was not consumed, and much new channel wood was observed from scorched bank trees. The probability of damage or degradation of water quality and aquatic habitat is likely, but the magnitude of consequence minor, making the risk low.

#### Cultural Resources (Prehistoric and Historic)

No cultural (prehistoric or historic) resources were identified as at risk at the time of this report. Based on the probability model created for the forest there remains a moderate probability that additional unknown prehistoric and historic resources are located within the Fall Creek fire perimeter. Treatment implementation is the main concern, with features and subsurface resources at risk of being damaged or exposed by restoration activities, erosion, and soil movement. The main concern for the archaeological resource is the location of equipment during road treatments and the disposal of any waste material created during road treatments. The possibility of damage or loss is unlikely due to the majority of low burn severity areas observed and the lack of road treatments recommended. The magnitude of consequences (loss of scientific data present in the archaeological deposits) is minor, making the risk very low.

#### **B. Emergency Treatment Objectives:**

Human Life and Safety:

Mitigate and minimize potential hazards from hazard trees, rocks, and debris flows with road and trail treatments, hazard signs, and closures

Property:

Protect road infrastructure by performing storm patrol and response.

Perform emergency trail stabilization, storm proofing and armoring of drainage crossings on segments at greatest risk of erosion during a high runoff event and sediment delivery to the North Umpqua Wild and Scenic River.

Natural Resources:

Protect native or intact plant communities from encroachment by invasives with emphasis on roads and trails within and adjacent to moderate and high severity burned areas. Protect OC Coho Salmon critical habitat by performing road and trail work.

Heritage and Cultural Resources:

To ensure cultural resources are not damaged by road and trail BAER treatment activities site inspections by a qualified archaeologist will be performed prior to any ground disturbing activity. Heritage specialists will assess locations where heavy equipment will work and be parked as well as locations where

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

Human Life & Safety 90-100% Roads 90-100% Trails 70-90% Natural Resources 50-90% Heritage and Cultural Resources 90-100%

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Human Life & Safety	90-100%	90-100%	90-100%
Property	70-90%	90-100%	90-100%
Natural Resources	50-90%	50-90%	50-90%
Heritage & Cultural Resources	90-100%	90-100%	90-100%

E. Cost of No-Action (Including Loss): **\$37,854 as determined below.**

Human Life and Safety – Without signs describing hazards present in the burned area a forest user could be unaware of risks and proceed without further consideration for their safety. For example minimizing exposure to fire-killed trees may not be a consideration for some forest users. The significance of protecting human life and safety is assumed self-evident and not included in the calculations used below to justify treatments.

Property – Certain road segments and trail segments have been identified as being susceptible to damage by post-fire peak flows and heightened runoff. A method called the Implied Minimum Value (IMV) is recommended by BAER leadership to determine the cost-benefit ratio for values at risk where market value is not available Calkin et. al., (USDA 2007). Since numerical values for cost to repair the damaged resources are not available an IMV is assigned to the Property Values at Risk which equals \$20,923.

Estim. cost of treatments: \$13,600
Estim. Probability of Damage or Loss w/o Treatment: 90%
Estim. Probability of Loss if Treated: 25%
IMV = Treatment Cost/(Probability Loss Untreated - Loss Treated)
Implied Minimum Value (IMV) for Property $\$13,600/(0.9-0.25) = \$20,923$

**Natural Resources** – Without treatments to minimize post-fire effects from the spread of known populations of invasive plant species, there is a risk of diminishing native vegetation and ecosystem diversity in wilderness and the areas. Using the IMV method, the value of the native plant communities in threatened areas is \$16,008.

Estim. cost of treatments: \$10,405
Estim. Probability of Damage or Loss: 90%
Estim. Reduction of Loss if Treated: 25%
IMV = Treatment Cost/(Probability Loss Untreated - Loss Treated)
IMV for Natural Resources: $\$10,405/(0.9-0.25) = \$16,008$

**Cultural Resources** – Using the IMV method, the value of the cultural treatments is \$923.

Estim. cost of treatments: \$600
Estim. Probability of Damage or Loss: 90%
Estim. Reduction of Loss if Treated: 25%
IMV = Treatment Cost/(Probability Loss Untreated - Loss Treated)
IMV for Natural Resources: $\$600 (0.9-0.25) = \$923$

**F. Cost of Selected Alternative (Including Loss): \$29,725 – details in treatment narrative section**

Treatment	Units	Unit Cost	# of Units	Total Cost
Life and Safety				\$5,120
Property				\$13,600
Natural Resources				\$10,405
Cultural Resources				\$600
<b>Total</b>				<b>\$29,725</b>

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input 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 type="checkbox"/>
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

Team Leader: Joe Blanchard

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H. Treatment Narrative:

**Human Life and Safety Treatments:**

**HL1 – Road Signage:** Install warning signs for flash flooding and potential debris flows. Replace warning and directional signs damaged by the fire. Install “Entering Burned Area Fallen Rock and Debris” signs where necessary to properly alert the travelers of the dangers ahead. “Road Closed” signs should also be used in with road closures, see emergency road closure.

Road	Location	Sign Type
4711	Immediately following the Blitzen Bridge	Entering Burned Area No Stopping Next 8 Miles
4711	On the south side of the 550 junction	Entering Burned Area No Stopping Next 8 Miles
4711-300	At the junction of the 4711 & 300 roads	Entering Burned Area Fallen Rocks And Debris
4711-330	At the junction of the 4711 & 330 roads	Entering Burned Area Fallen Rocks And Debris
4711-420	At the junction of the 4711 & 420 roads	Entering Burned Area Fallen Rocks And Debris
4711-440	At the junction of the 4711 & 440 roads	Entering Burned Area Fallen Rocks And Debris
4711-500	At the junction of the 4711 & 500 roads	Entering Burned Area Fallen Rocks And Debris
4711-550	At the junction of the 4711 & 550 roads	Entering Burned Area Fallen Rocks And Debris
4711-550	On the west side of the fire boundary	Entering Burned Area Fallen Rocks And Debris
4711-270	At the junction of the 4711 & 270 roads	Entering Burned Area Fallen Rocks And Debris
4711-265	At the junction of the 4711 & 265 roads	Entering Burned Area Fallen Rocks And Debris
4711-013	At the junction of the 4711 & 013 roads	Entering Burned Area Fallen Rocks And Debris

**HL2 – Emergency Road Closure:** Emergency road closure should be signed to protect human life, safety, and property. Road closures should be temporary and roads should be re-evaluated and re-opened when hazards are no longer a threat.

Emergency Closures- Road Maintenance Level	Total Miles
Designated Motorized Trail	1.70
2 - High Clearance Vehicles	18.40

<b>Total</b>	<b>20.10</b>
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<b>Emergency Road Closures</b>		
<b>Road</b>	<b>Length</b>	<b>Maintenance Level</b>
4711-265	0.10	2 - High Clearance Vehicles
4711-270	1.13	2 - High Clearance Vehicles
4711-275	0.13	2 - High Clearance Vehicles
4711-290	0.81	2 - High Clearance Vehicles
4711-292	0.07	2 - High Clearance Vehicles
4711-293	0.12	2 - High Clearance Vehicles
4711-294	0.53	2 - High Clearance Vehicles
4711-296	0.11	2 - High Clearance Vehicles
4711-300	0.65	2 - High Clearance Vehicles
4711-301	0.16	2 - High Clearance Vehicles
4711-309	0.16	2 - High Clearance Vehicles
4711-310	0.07	2 - High Clearance Vehicles
4711-330	5.12	2 - High Clearance Vehicles
4711-333	0.47	2 - High Clearance Vehicles
4711-335	0.85	2 - High Clearance Vehicles
4711-350	0.58	2 - High Clearance Vehicles
4711-352	0.68	2 - High Clearance Vehicles
4711-370	0.29	2 - High Clearance Vehicles
4711-382	0.97	2 - High Clearance Vehicles
4711-383	0.10	2 - High Clearance Vehicles
4711-385	0.08	2 - High Clearance Vehicles
4711-420	0.21	2 - High Clearance Vehicles
4711-425	0.38	2 - High Clearance Vehicles
4711-430	0.20	2 - High Clearance Vehicles
4711-440	2.90	2 - High Clearance Vehicles
4711-445	0.29	2 - High Clearance Vehicles
4711-455	0.61	2 - High Clearance Vehicles
4711-472	0.07	2 - High Clearance Vehicles
4711-500	0.46	2 - High Clearance Vehicles
4711-570	0.10	2 - High Clearance Vehicles
4711-375	0.27	Trail, OHV <= 50"
4711-377	0.07	Trail, OHV <= 50"
4711-380	0.38	Trail, OHV <= 50"
4711-390	0.29	Trail, OHV <= 50"
4711-447	0.49	Trail, OHV <= 50"
4711-465	0.2	Trail, OHV <= 50"

**HL3 – Trail Signage:** Two warning signs will be posed at each end of the Tioga section of the NUT and two signs will be placed at the nearest raft put-ins on the North Umpqua River. The signs will inform users

of the dangers associated with entering and recreating within a burned area. The signs will state the hazard of unanticipated flash flood, falling snags or limbs from fire-killed trees, and falling rock from cut banks.

Human Life and Safety Treatment	Units	Unit Cost	# of Units	Total Cost
HS1 – Road Signage	Signs	\$410	12	\$4,920
HS2 – Emergency Road Closure	Project	\$0	36	\$0
HS3- Trail Signage	Signs	\$50	4	\$200
<b>Life and Safety Total</b>				<b>\$5,120</b>

#### **Property Treatments – Roads and Trails:**

**R1-Road Treatments** - The purpose of patrols is to identify those road problems such as plugged culverts and washed out roads and to clear, clean, and/or block those roads that are or have received damage. Storm patrol will be limited to larger storm events where the potential for road problems is more likely and will be prioritized to locations in the fire with the highest concern for storm 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.

Construction Specifications
1. FS personnel will direct the work. The patrols are used to identify those road problems such as plugged culverts and washed out roads and to clear, clean, and/or block those roads that are or have received damage.
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. The road patrols shall bring in heavy equipment necessary to mechanically remove any obstructions from the roads and culvert inlets and catch basins where necessary.
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.

**T1 Trail Treatments**– The NUT is near the bottom of a steep mountain slope and has a very narrow trail tread. Although most of the fire is in areas of low to moderate burn severity, even minor sluffing, collapsing of the trail, or heavy runoff would cause significant damage to the trail tread. Drainage improvements to divert elevated runoff will occur along 2.5 miles of the NUT, focused in localized areas of moderate soil burn severity and where the trail crosses drainages, wet areas and sections with near vertical slopes. Work will include storm proofing, armoring drainages, and installing drainage features. Work will be accomplished by NW Youth Corps or similar using existing agreements, 2 weeks likely needed.

Property treatments Roads and trails	Units	# of Units	Unit Cost	Total Cost
P1- Storm Patrol team	Days	2	300	600
P1- Storm Patrol equipment	Days	2	\$2,000	\$4,000
T1 – NUT Trail Stormproofing	miles	2.5	\$3,600	\$9,000
<b>Property Treatments Total</b>				<b>\$13,600</b>



**Natural Resources Treatments: Invasive Plants** – Surveys and manual treatment is recommended to protect native plant communities from the spread of non-native invasive species. There are known small populations of Armenian blackberry, meadow knapweed, Canada thistle, Scotch broom and tansy ragwort in and adjacent to the burned area along the road prism that are very likely to spread into the newly burned areas. Survey and treatments will focus on known populations with the burned areas as well as along dozer lines, roads cleared and used as fire breaks, and the North Umpqua river trail section within the fire perimeter as these areas are the primary vectors for the spread of invasive species.

**NR1 and NR2 – Survey and Chemical Treatment:** To prevent the infestation of intact native plant habitat in the Fall Creek fire area the BAER team strongly recommends survey, detection, and treatment of the five most aggressive invasive plant species present in the burned area. Initial survey and treatment of invasive populations will take place in the spring and summer of 2018. Invasive plant surveys and documentation will occur on 45 miles of roads and trails within and adjacent to the burned area. Treatment will occur on those portions of the road and trail prisms where these invasive species are found, assuming that areas of moderate to high burn severity are the most likely to be invaded by noxious weeds, we propose to fund 25 acres of mechanical treatment. The treated populations will be re-surveyed and treated again if necessary. The 25 acres of proposed treatments was calculated from field mapping of existing noxious weed infestations near or against the black where all vegetation was consumed and highly vulnerable to invasion by these roadside infestations.

<b>Natural Resources Treatments</b>	<b>Units</b>	<b># of Units</b>	<b>Unit Cost</b>	<b>Total Cost</b>
NR1 – Invasive Survey and Detection	Miles	45	\$89	\$4,005
NR2 – Invasive Plant Treatment	Acres	25	\$180	\$4,500
GS-9 administration of survey and treatment and data entry	Day	4	\$300	\$1,200
Effectiveness monitoring of invasive plant treatment	Days	2	\$350	\$700
<b>Natural Resources Total</b>				<b>\$ 10,405</b>

**Cultural Resources Treatments: Pre-implementation clearance** – Archaeological surveys will be necessary to protect heritage values at risk from impacts of implementing other BAER treatments. It is important that there is coordination between heritage resource specialists and other specialists in the implementation phase so cultural resources are not lost or damaged during treatment implementation.

**CR1** – To avoid damage to cultural resources by equipment and actions during implementation and comply with Section 106 of the National Historic Preservation Act qualified archeologists will perform assessment of the work sites and the proposed activities. Five days of work to check the road and trail prisms for Archeological resources will be conducted prior to any work in the area if proposed.

<b>Cultural Resources Treatments</b>	<b>Units</b>	<b># of Units</b>	<b>Unit Cost</b>	<b>Total Cost</b>
CR1 – Implementation Survey and Section 106 Compliance	Days	2	\$300	\$600

- I. **Monitoring Narrative: Effectiveness monitoring for invasive plant treatment is included in Natural Resource Treatments section. No additional monitoring is requested.**



## Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

Line Items	Units	Unit Cost	NFS Lands		Other \$
			# of Units	WFSU SULT \$	
<b>A. Human Life &amp; Safety</b>					
HS1 - Road signage	each	\$410	12	\$4,920	\$0
HS2 - Trail signage	each	\$50	4	\$200	\$0
<i>Insert new items above this line!</i>				\$0	\$0
<b>Subtotal Land Treatments</b>				\$5,120	\$0
<b>B. Property</b>					
R1- Road storm patrol	days	\$2,300	2	\$4,600	\$0
T1 - Trail storm proofing	miles	\$3,600	2.5	\$9,000	\$0
<i>Insert new items above this line!</i>				\$0	\$0
<b>Subtotal Channel Treat.</b>				\$13,600	\$0
<b>C. Natural Resources</b>					
NR1 - Invasives Detection	miles	\$89	45	\$4,005	\$0
NR2 - Invasives Treatment	acres	\$180	25	\$4,500	\$0
Invasives Admin	days	\$300	4	\$1,200	\$0
Invasive Monitoring	days	\$350	2	\$700	\$0
<i>Insert new items above this line!</i>				\$0	\$0
<b>Subtotal Road &amp; Trails</b>				\$10,405	\$0
<b>D. Cultural Resources</b>					
CR1- Implementation compliance	days	\$300	2	\$600	\$0
				\$0	\$0
				\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0
<b>Subtotal Structures</b>				\$600	\$0
<b>E. BAER Evaluation</b>					
				\$8,750	\$0
				\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0
<b>Subtotal Evaluation</b>				\$8,750	\$0
<b>F. Monitoring</b>					
				\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0
<b>Subtotal Monitoring</b>				\$0	\$0
<b>G. Totals</b>				\$29,725	\$0

**PART VII - APPROVALS**

1. \_\_\_\_\_  
Forest Supervisor (signature)

\_\_\_\_\_  
Date

2.  \_\_\_\_\_  
Regional Forester (signature)

 \_\_\_\_\_  
Date