Date of Report: August 23, 2023

BURNED-AREA REPORT

PART I - TYPE OF REQUEST

A. Type of Report

☒ 1. Funding request for estimated emergency stabilization funds

☐ 2. No Treatment Recommendation

B. Type of Action

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

☒ 2. Interim Request # 1

☒ Updating the initial funding request based on more accurate site data or design analysis

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Cedar Creek Fire

B. Fire Number: OR-WIF-220180

C. State: Oregon

D. County: Lane

E. Region: 6

F. Forest: Willamette & Deschutes

G. District: Middle Fork (WIL) & Crescent (DES)

H. Fire Incident Job Code: P6PYP6 (0618)

I. Date Fire Started: August 1, 2022

J. Date Fire Contained: ~October 31, 2023

K. Suppression Cost: $115.5 million (10/7/2022)

L. Fire Suppression Damages Repaired with Suppression Funds (estimates):

1. **Fireline repaired (miles): 473 miles of Suppression Line Identified**
2. **Other (identify):**

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
Black Creek	22,066	21,606	97.9
Charlton Creek	18,967	3,244	17.1
Dartmouth Ck-NFMF Willamette	21,986	3,976	18.1
Deer Ck	11,565	3,246	28.1
Devils Canyon-NFMF Willamette	24,074	11,750	48.8
Eighth Creek- NFMF Willamette	15,366	1,079	7.0
Fisher Creek NFMF Willamette	26,499	7,311	27.6

Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
Lower Salmon Creek	35,280	25,039	71.0
Lower Salt Creek	20,948	8,310	39.7
Middle Salt Creek	22,533	2,942	13.1
Skookum Creek-NFMF Willamette	25,218	12,975	51.5
Upper Salmon Creek	24,817	24,817	100.0
Upper Salt Creek	28,927	3	0.1
Waldo Lake- NFMF Willamette	19,042	4,611	24.2

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	127,311
OTHER FEDERAL (LIST AGENCY AND ACRES)	0
STATE	0
PRIVATE	0
TOTAL	127,311

O. Vegetation Types: The vegetation types within the Cedar Creek Fire perimeter are comprised in large part of Douglas-fir, Western hemlock and Pacific silver fir. Higher elevations are dominated by mountain hemlock and sub alpine fir with two whitebark pine communities around Mt. Fuji. Understory vegetation varies by aspect, elevation and canopy cover but Oregon grape (*Mahonia nervosa*), Salal (*Gaultheria shallon*), vine maple (*Acer circinatum*), rhododendron (*R.macrophyllum*) and swordfern (P*olystichum munitum*) are the most common species under Hemlock or Douglas fir associations. At higher elevations primarily beargrass (X*erophyllum tenax*) and huckleberry (*Vaccinium sp.*) dominate the understory. Over the east side of the crest, primarily on the Deschutes NF, vegetation transitions to white fir, lodgepole and ponderosa pine. Non-forested sites comprise 6% of the fire area and included wetlands, hardwoods, rock gardens as well as a diverse forb dominated dry, mesic and wet meadow communities. These meadow systems comprise a mosaic of unique or special habitats within a forested landscape that are comprised of unique plant communities and often include rare or sensitive plant species.

P. **Dominant Soils:** The soils within the Cedar Creek Fire are mapped under two Soil Resource Inventories (SRI)--the Willamette National Forest SRI (Legard and LeRoy, 1973) and the Deschutes National Forest SRI (Larsen, 1976). Soils across the fire area are dominated by sandy loam to loam textures and are largely derived from glacial deposits, colluvial materials, or residuum from tuffs, breccias, andesites and basalts. Most soils have volcanic ash in surface layers. Soil temperature regimes range from mesic to cryic and moisture regimes are generally udic. Clay loam surface textures and high water tables (aquic moisture regimes) are found in many drainageways and near some lakes. As one moves to the east, the landscape transitions to gentler terrain influenced by more recent glacial processes, soils become even rockier, coarser textured, lower in organic matter, and less developed. Soils on convex landscape positions and on ridgetops tend to be shallow to bedrock while concave landscape positions and soils in drainageways tend to have very thick, gravelly to cobbly subsoils (glacial till or outwash deposits). Talus slopes and debris chutes punctuate the landscape. Wet meadows and organic-rich soils are present in many of the lake basins. Volcanic ash and pumice from the eruption of Mt. Mazama has a stronger influence on soils east of the Cascade Crest, mainly on the Deschutes National Forest. These soils trend toward loamy sand surface textures. The most common SRI mapping units are SRI 61 (shallow gravelly loam residual and colluvial soils on sideslopes and ridges), SRIs 92 and 93 (shallow to moderately deep sandy loams and

loams on glacial flats and benches derived from pumice and ash over glacial till), and SRI 16 (deep to very deep loams and sandy loams found on midslopes, toeslopes and valley bottoms derived from colluvium, glacial till, and alluvium).

Q. **Geologic Types:** The bedrock types within the Cedar Creek Fire perimeter are a wide variety of Eocene to Holocene of basalt, basaltic andesite, dacite, pyroclastic and rhyolite in the form of vents, domes, flows and cones. Unconsolidated deposits of volcanic ash, pumice, and cinders are common**.** At the surface, overlying the igneous extrusive rock units are surficial deposits, mostly unconsolidated alluvium, fluvial glacial deposits, glacial till, talus, hummocky landslide debris and fan deposits. Quaternary deposits of differing ages occur along the major drainages. The base of some of the steep slopes are covered by alluvial fan deposits emanating from the steep chutes of the mountain ridges. These fan deposits are composed of mainly coarse cobbly alluvium. Known landslides and landslide deposits are mapped within the Cedar Creek burned area. These landslides, generally possessing well-defined bounds, consist of hummocky earth flows and rubbly rock material. Some older landslide deposits lack, or have considerably modified, landslide morphology.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	238
INTERMITTENT	319

S. **Transportation System:**
Trails: *National Forest (miles):* 142 *Other (miles):*
Roads: *National Forest (miles):* 469 *Other (miles):* 0

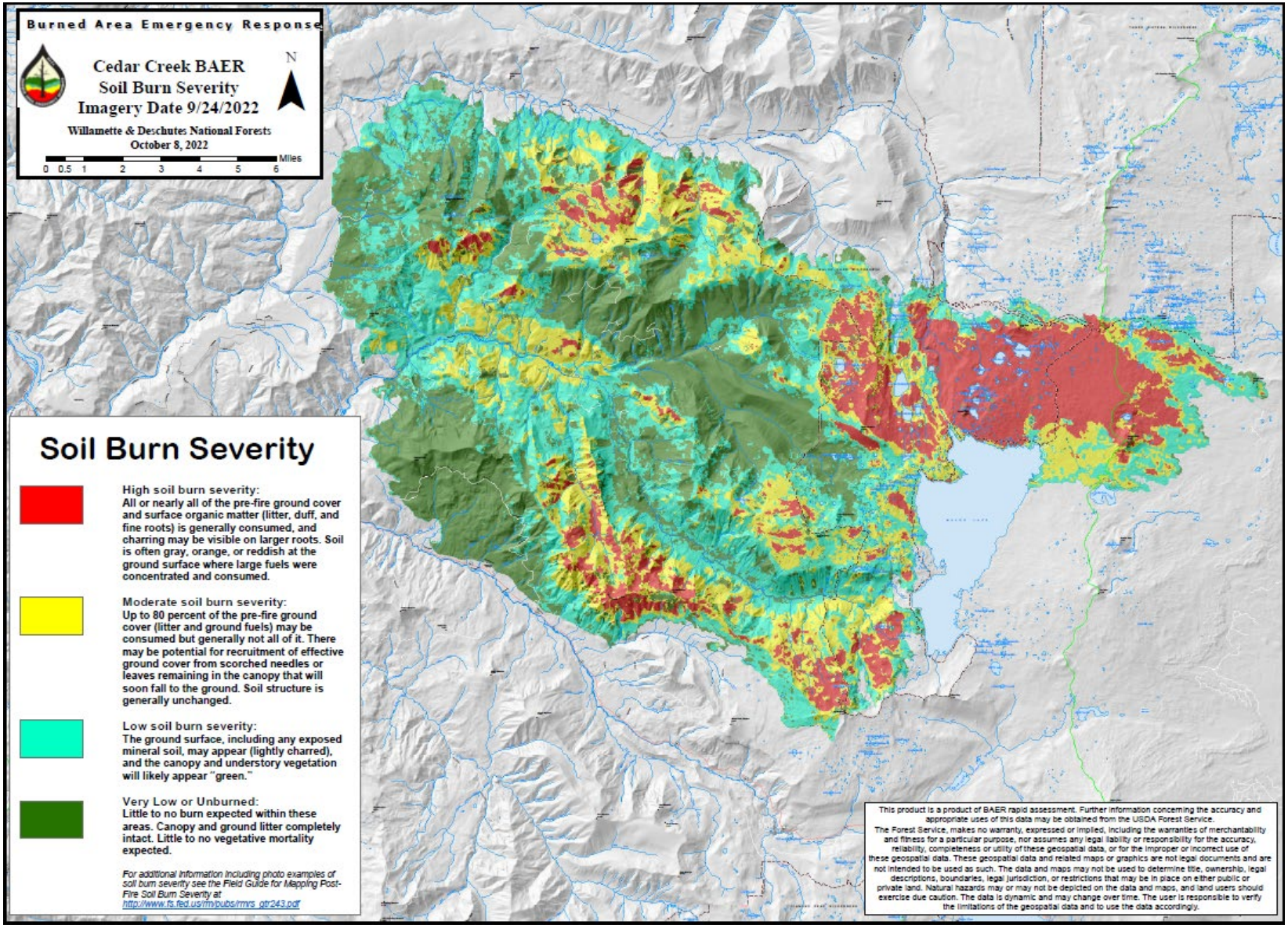
Oper_Maint_Level	**Total**
1 - BASIC CUSTODIAL CARE (CLOSED)	50
2 - HIGH CLEARANCE VEHICLES	375
3 - SUITABLE FOR PASSENGER CARS	28
4 - MODERATE DEGREE OF USER COMFORT	14
5 - HIGH DEGREE OF USER COMFORT	2
Grand Total	**469**

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	% within the Fire Perimeter
Unburned	41,555	32
Low	41,156	31
Moderate	28,087	21
High	20,109	15
Total	130,908	


Burned Area Emergency Response
Cedar Creek BAER
Soil Burn Severity
Imagery Date 9/24/2022
Willamette & Deschutes National Forests
October 8, 2022
N
0 0.5 1 2 3 4 5 6 Miles
Soil Burn Severity
High soil burn severity:
All or nearly all of the pre-fire ground cover and surface organic matter (litter, duff, and fine roots) is generally consumed, and charring may be visible on larger roots. Soil is often gray, orange, or reddish at the ground surface where large fuels were concentrated and consumed.
Moderate soil burn severity:
Up to 80 percent of the pre-fire ground cover (litter and ground fuels) may be consumed but generally not all of it. There may be potential for recruitment of effective ground cover from scorched needles or leaves remaining in the canopy that will soon fall to the ground. Soil structure is generally unchanged.
Low soil burn severity:
The ground surface, including any exposed mineral soil, may appear (lightly charred), and the canopy and understory vegetation will likely appear "green."
Very Low or Unburned:
Little to no burn expected within these areas. Canopy and ground litter completely intact. Little to no vegetative mortality expected.
For additional information including photo examples of soil burn severity see the Field Guide for Mapping Post-Fire Soil Burn Severity at
http://www.fs.fed.us/rm/pubs/rmrs_gtr243.pdf
This product is a product of BAER rapid assessment. Further information concerning the accuracy and appropriate uses of this data may be obtained from the USDA Forest Service.
The Forest Service, makes no warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, nor assumes any legal liability or responsibility for the accuracy, reliability, completeness or utility of these geospatial data, or for the improper or incorrect use of these geospatial data. These geospatial data and related maps or graphics are not legal documents and are not intended to be used as such. The data and maps may not be used to determine title, ownership, legal descriptions, boundaries, legal jurisdiction, or restrictions that may be in place on either public or private land. Natural hazards may or may not be depicted on the data and maps, and land users should exercise due caution. The data is dynamic and may change over time. The user is responsible to verify the limitations of the geospatial data and to use the data accordingly.

B. **Water-Repellent Soil (acres):** Hydrophobic soils were present at nearly every point that was assessed in the field across all burn severity classes. Significant natural hydrophobicity is common in ash-influenced soils in the Cascades. When organic layers are removed by fire, runoff related to naturally occurring hydrophobicity may be more pronounced. It is likely that fire also exacerbated existing hydrophobicity and increased its extent, but it is not possible to make reliable predictions about fire effects and the extent of fire-induced hydrophobicity. Based on field assessments and knowledge of local soil types, some degree of hydrophobicity should be assumed on all upland acres.

C. Soil Erosion Hazard Rating:

Erosion Hazard Rating	Acres	Percent
Severe	55,194	42%
Moderate	66,771	51%
Low	8,056	6%
Not rated (water)	887	1%
Grand Total	**130,908**	**100%**

Moderate and High SBS in Severe Erosion Hazard	Total Acres	% of Total Burned Acres
High SBS, Severe Erosion Hazard	4,400	3%
Moderate SBS, Severe Erosion Hazard	11,150	9%
Total	**15,550**	**12%**

D. **Erosion Potential:** Pre-fire erosion potentials are assumed to be negligible in undisturbed soils. The average erosion potential for the 3-year storm across burned FS lands in the Cedar Creek Fire is about 5.8 tons per acre. The following erosion rates for selected HUC12 watersheds of concern were calculated from post-fire erosion models for a 1.5- and 3-year precipitation event in Disturbed WEPP (see Soils Report). 3-year event values are reported here.

Cedar Creek HUC12 Subwatersheds	3-Year Event Mean Erosion Potential (tons per acre) for Burned Areas Only	3-Year Event Mean Erosion Potential (tons per acre) for Entire Watershed
Black Creek	**7.5**	**7.3**
Devil's Canyon-North Fork Middle Fork Willamette River	**7.0**	**3.4**
Fisher Creek- North Fork Middle Fork Willamette River	**7.4**	**2.0**
Lower Salmon Creek	**8.3**	**5.9**
Lower Salt Creek	**5.3**	**2.1**
Middle Salt Creek	**16.7**	**2.2**
Waldo Lake- North Fork Middle Fork Willamette River	**1.2**	**0.3**

E. **Sediment Potential:** Assuming a 50% delivery ratio of reported erosion rates, the average sediment potential across burned FS lands in the Beachie Creek Fire is about 2.9 tons per acre.

F. Estimated Vegetative Recovery Period (years): Vegetation recovery will vary depending on plant association group, soil type, aspect, and soil burn severity. Areas that burned at low severity will generally

recover within the first two years. Areas that burned with moderate soil severity may recover the shrub layer, for the most part, in 3-5 years with canopy formation occurring much later. For sites with high soil burn severity and full vegetative stand- replacement, recovery may take decades.

G. Estimated Hydrologic Response (brief description): Model predictions indicate that peak flows at modelled poursheds may increase 1.0 – 2.3 times the pre-fire condition. The highest increases are expected in small and mid-sized poursheds with higher proportions of high and moderate soil burn severity. The watershed response will likely also include an initial flush of ash and burned materials, rill and gully erosion in drainages on steeper slopes, and higher potential for debris-laden flows. Model predictions of post-fire peak flows at larger poursheds, such as the North Fork Middle Fork Willamette River, have a smaller relative increase due to higher proportions of unburned and low soil burn severity. Waldo Lake has relatively low risk of sediment delivery within the majority of the basin; however, isolated areas high/moderate burn severity on steeper slopes and may deliver ash and fine sediments to the lake resulting in relatively short term (0-3 years) and minor reductions to water clarity.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

A. Describe Critical Values/Resources and Threats (narrative):

Table 5: Critical Value Matrix

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

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment	Notes
Recreation											
BAER critical value	Life and Safety	Any non Wz trail in high or moderate SBS	Hazard trees	Possible	High mortality due to post-fire conditions	Major	Loss of life or injury to humans	High	Felling of hazards trees and closure of trail at trailheads	**S1b. Post trail/recreation hazard signs** and **S2.** Close trail	Bunchgrass 3559, Fuji Mtn Trail 3674, Jim Weaver Loop 3590, Warm Springs 3582, Owl Cabin Way 3571,
BAER critical value	Life and Safety	Any Wz trail in mod or high SBS	Hazard trees	Possible	High mortality due to post-fire conditions	Major	Loss of life or injury to humans	High	Closure of trail at trailheads	**S1b.** Post trail/recreation hazard signs and **S2.** Close trail	Koch Mtn 3576, High Divide 3572, Black Creek 3551,
BAER critical value	Life and Safety	Black Creek TH	Erosion; debris flow damage to recreation site	Very Likely	High percent of high and moderate SBS drains to recreation site	Moderate	Steep slopes; high percent of high and moderate SBS; trail follows creek	Very High	Closure of trail at trailheads	**S1b.** Post trail/recreation hazard signs and **S2.** Close trail	
BAER critical value	Life and Safety	All trailheads within fire perimeter with high or mod SBS	Tree strike/hazard trees	Likely	Vehicles, stock trailers and people associated with them are stationary targets	Major	Possible injury or death	Very High	Close trail head until danger is mitigated and post warning about hazards	**S1b.** Post trail/recreation hazard signs and **S2.** Close trail until hazard trees are mitigated	
BAER critical value	Life and Safety	Dispersed Camping Areas along Rd 19 from Shale Ridge TH to 1900-058	debris flows, flood hazards	Unlikely	People are unlikely to be there during precip events. Several camping areas are next to the river.	Major	Loss of life or injury to humans	Intermediate	Close camp sites and/or post warnings	**S1b.** Post trail/recreation hazard signs **S2.** Close camp sites a	in the floodplains.
BAER critical value	Property - Other	Dispersed Camping Areas along Rd 19 from Shale Ridge TH to 1900-058	debris flows, flood damage	Possible	Sites along the river will be impacted if a precip event large enough occurs	Minor	Dispersed camp sites are user created and will be user re-created very quickly	Low	None	None	
BAER critical value	Property - Trails	Black Creek 3551	Erosion, debris flow, damage to structures	Very Likely	Steep trail and a high percent of moderate and high SBS draining towards the trail	Major	Loss of trail tread resulting in infrastructure impacts on a highly recreated trail	Very High	Trail tread stabilization (additional drainage features) by waterbarring the trail every 100 feet; closure of trail at trailheads	**T1.** Trail Tread Stabilization	Very delicate trail that follows a very steep creek. If it is muddy and wet there could be more erosion occurring.

BAER critical value	Property - Trails	High Divide 3572	Erosion, debris flow, damage to trail tread	Likely	High percent of high and moderate SBS drains to toward trail	Minor	Low Use trail. Recoverable or localized soil erosion effects because where trail is steep it is armored from rock.	Low	No treatment	No treatment	Debris flow (DF) - unlikely - moderate – **low** (high on ridge trail)
BAER critical value	Property - Trails	Mt Ray 3682	Erosion, debris flow, tread damage	Possible	Moderate amount of high SBS drains to trail along Black Creek	Moderate	Moderate property damage	Intermediate	No treatment	No treatment	DF - possible - moderate - intermediate
BAER critical value	Property - Trails	Jim Weaver Loop 3590	Erosion and trail tread damage	Likely	Low percent of high SBS drains to creeks on west shore	Moderate	Low amount of high SBS is upslope; slopes are low gradient	High		**T1**-Trail Drainage Stabilization	Trail Drainage Stabilization will also benefit prevention of sediment into Waldo Lake.
BAER critical value	Property - Trails	Warm Springs 3582	Erosion, debris flow, trail tread damage, and hot pool damage	Possible	Large area of moderate SBS drains to spring and creek along trail	Moderate	Trail is partially on a terrace above the creek	intermediate	No treatment	No treatment	Trail leads to moderately popular hot spring; DF - possible - moderate - intermediate
BAER critical value	Life and Safety	Huckleberry Flats OHV Area Trails	Hazard trees	Unlikely	Low or underburn only	Major	Loss of life or injury to humans	intermediate	Warning signs	**S1b.** Post trail/recreation hazard signs at staging area and all trail/road intersections	
BAER critical value	Property - Trails	Huckleberry Flats OHV Area Trails	Erosion and trail tread damage	Unlikely	Low or underburn only in surrounding area	Moderate	Investment in trail infrastructure	Low	No treatment	No treatment	
BAER critical value	Property - Trails	Blair Lake 3553	Erosion and trail tread damage	Likely	Several stream xings; long trail; potential for comprised trail drainage.	Moderate	Investment in trail infrastructure	High	Trail tread stabilization	**T1.** Trail Drainage Stabilization	Stream crossing of North Fork River is especially prone to trail tread damage. Moderate debris flow potential for lowest section of trail - possible - moderate - **intermediate**
BAER critical value	Property - Trails	North Fork 3666-5	Erosion, trail tread damage, debris flows, structure damage	Very Likely	Trail follows river's edge and is prone to flooding	Major	Investment in trail infrastructure	High	Trail rerouting	No effective treatment	Trail is poorly designed within feet of river and on the same elevation; DF - unlikely - moderate – low (high on ridge trail (trail outside of fire, on far side of North Fork)
BAER critical value	Property - Trails	Fisher Creek 3565	No threat	Unlikely	Trail is recovering naturally	Minor	Trail was abandoned 9 years ago	Very Low	No treatment	No treatment	Trail was abandoned 9 years ago, it is no longer maintained. It is recovering naturally.

BAER critical value	Property - Trails	Mostly interior Wilderness Trails	Trail feature, tread and rootwad damage; debris flow,	Likely	High and moderate SBS	Moderate	Roughly 50 miles of trail impacted by fire with many areas of potential property damage	High	Trail closure, trail tread stabilization, warning signs	**S1b.** Post trail/recreation hazard signs and **S2.** Close trail	Tread stabilization on these interior trails is not possible before winter. Shale Ridge 3567, Winchester 3594, Winchester Ridge 3596, Rigdon Lakes 3555, Waldo Mountain 3592, Six Lakes 3597, Whig and Torrey 3581, Upper Quinn 3597.1 Swan Lake 3570 Waldo Meadows 3591 Waldo Ridge 4390 Taylor Butte 3580 Eastern Brook Lake 3552 Fields Lake 3579 Helen Lake 3577 Wahanna 3583, Spirit Lake 3584; Trails are not hydrologically connected to Waldo Lake therefore sedimentation is not expected.
BAER critical value	Property - Trails	Joe Goddard's Grove 3690	Erosion, damage to interpretation, structure and tread damage	Likely	High and moderate SBS above Black creek swamp feeds small streams within the trail system.	Major	Investment in trail infrastructure	Very High	Trail tread stabilization	T1. (Trail drainage stabilization) Perform emergency drainage work along affected portions of trails leading to rec site	Major trail bridge leading into the trail system was destroyed by a falling tree. Other minor trail structure within the trail system may be damaged ~6 (i.e. culvert, turnpike, puncheon). Historical significance. Prioritize work on this trail before others.
BAER critical value	Property - Trails	PCT 2000	Erosion, damage to tread from falling trees	Possible	Very few trail miles are affected by high SBS	Minor	Most of the trail area is low and moderate SBS.	Low	None	Natural recovery and summer maintenance	Segment within the fire perimeter is 5 miles long from Irish Lake south to Charlton Lake.
BAER critical value	Life and Safety	PCT 2000	Hazard trees impacting hikers	Unlikely	Majority is low soil burn severity	Major	Loss of human life or injury	intermediate	Fell hazard trees, post warning hazard signs, trail closure	**S1b.** Post trail/recreation hazard signs and **S2.** Closure of trail; work with PCT association to find a detour for trail.	
BAER critical value	Property - Other	Lemish Lake TH	Erosion and debris flow	Possible	Greater than 500 acres of high SBS; drains toward Lemish	Minor	Minor property damage	Low	Trail tread stabilization; warning signs	No treatment	Not inside fire perimeter.
BAER critical value	Property - Trails	Many Lakes TH	Erosion, debris flow, damage to TH and TH structures	Likely	>5000 acres of moderate and high SBS drain toward TH	Moderate	Investment in trail infrastructure	High	S3. Fell hazard trees and S1b. sign TH to warn users of hazards; R1. Stormproofing	**S3.** Fell hazard trees and **S1b.** sign TH to warn users of hazards; **R1**. Stormproofing	On Deschutes. Significal potential for debris flows to Many Lakes TH and the first mile of Trail 99 near Many Lakes TH; DF - unlikely (low topo relief) – moderate (moderate SBS) – low
BAER critical value	Property - Trails	Lily Lake 19-3, Charlton 19, Lemish Lake 18, Clover Meadow 21, Metolius Windigo 99	Erosion, rootwad damage, debris flow	Likely	Several areas of high and mod SBS	Moderate	Investment in trail infrastructure	High	Trail tread stabilization to maintain drainage before winter	**T1.** (Trail drainage stabilization) Trail tread stabilization to maintain drainage before winter	On Deschutes NF. Some potential to damage trail/structures/rec site from debris flow near stream xings and into rec site

BAER critical value	Property - Other	Blair Lake Campground	Potential for snags to fall and damage property	Likely	Potential for snags to damage property	Moderate	Investment in campground infrastructure such as CXT toilets.	High	Close campground and fell hazardous trees	**S3.** (Hazard Tree Falling) Hazard tree removal before winter to protect structures, especially near vault toilet to preserve Wall Creek (downslope) water quality	
BAER critical value	Property - Other	Huckleberry Lookout	Potential for snags to fall and damage property	Unlikely	Surrounding vegetation low tree mortality; Fire crews prepped lookout with fire resistant wrap and cleared brush around structure	Moderate	Active fire lookout	Low	Fell hazardous trees within fall distance of lookout	No treatment	
BAER critical value	Property - Other	North Waldo Campground	Potential for snags to fall and damage property	Likely	Potential for snags to damage property	Moderate	Loss of infrastructure resulting in property damage	High	Close campground and fell hazardous trees before winter	**S3.**Hazard tree removal before winter around picnic tables, kiosks, toilets, amphitheater, and boat ramp	
BAER critical value	Property - Other	Islet Campground	Potential for snags to fall and damage property	Likely	Potential for snags to damage property	Moderate	Loss of infrastructure resulting in property damage	High	Close campground and fell hazardous trees before winter	**S3.** Hazard tree removal before winter around picnic tables, kiosks, toilets, and boat ramp	
BAER critical value	Life and Safety	Blair Lake, North Waldo, Islet Campgrounds, and Huckleberry Lookout	Hazard trees	Likely	Moderate tree mortality and fire damage has the potential to fall and injure humans	Major	Loss of human life or injury	Very High	Post warning signs, close campground, remove hazard trees, monitor suspect trees frequently	**S2.** Close campground until hazard trees are removed, post warning signs, install gate	For North Waldo and Islet Campgrounds: Install a gate across Waldo Lake Rd 5897 just north of Shadow Bay Rd 5896 to prevent public from accessing these areas. Huckleberry Lookout is staffed during the summer months, otherwise the structure is uninhabited
BAER critical value	Life and Safety	Huckleberry OHV Area	Danger trees	Unlikely	Mostly in low and unburned soil burn severity areas.	Major	Loss of human life or injury	Intermediate	Post warning signs, remove danger trees	**S1b.** Sign TH to warn users of hazards	Likelihood of danger tree falling and injuring a human is low due to the public being on motorized equipment in the area
BAER critical value	Property - Other	Huckleberry OHV Area	Fire weakened trees could fall and damage property	Possible	Danger trees has the potential to damage property	Major	Loss of infrastructure resulting in property damage	High	Fall hazardous trees near property structures	**S3.** Fall hazardous trees before winter snowfall to mitigate the chance of property being damaged	Structures of concern would be fencing, toilets, sign kiosk, and shelter within the OHV area.
Natural Resources- Soils/Water											

BAER critical value	Natural Resources - Soil and Water	Soil Productivity	Post-fire erosion	Very Likely	Initial precipitation events will cause hillslope erosion due to steep slopes and loss of ground cover in high soil burn severity	Moderate	15% percent of the fire has high soil burn severity where losses would be greatest; high rock content of soils and down wood component would limit major off site losses; 62% percent of the fire is in lower soil burn severities where vegetation and ground cover will increase rapidly post-fire	Very High		No treatment	High surface rock content
BAER critical value	Natural Resources - Soil and Water	Hydrologic Function	Sediment delivery to waterbodies and runoff	Likely	Large patches of high and moderate soil burn severity on steep slopes; potential for debris flows	Minor	Short term and localized effects due to ground cover loss. Unburned and intact riparian areas at lower elevations will help capture sediment	Low	Allow natural recovery	No treatment	High annual rainfall in the fire perimeter will help increase the rate of vegetation recovery.
BAER critical value	Natural Resources - Soil and Water	North Fork Middle Fork Willamette River- Wild and Scenic River	Sediment delivery to waterbodies, runoff, flooding, debris	Possible	Runoff and debris flows iniating in steeper headwaters may transport downstream, but the majority of the Wild and Scenic river corridor is in low or unburned soil burn severity; and the watershed is largely unaffected by the fire.	Minor	Short term and recoverable effects from the fire. Also, the river corridor has intact riparian areas with high ground cover that can help capture sediments	Low	Allow natural recovery	No treatment	North Fork Middle Fork Willamette Rver are classified Wild & Scenic Rivers North Fork Middle Fork Willametter ORV are recreation, vegetation, scenic, water quality, fish, wildlife, geologic/hydrologic and historic.

BAER critical value	Natural Resources - Soil and Water	Water Quality- Waldo Lake	Runoff, sediment, ash, nutrient delivery, debris flow	Likely	Patches of steeper terrain with high/mod SBS and minimal or non-existent near-lake vegetated buffer strips are present; these areas are expected to delivery ash and sediment to Waldo Lake. Waldo lake trail and campgrounds are compacted surfaces at lake perimeter that may route sediment into the lake.	Minor	Reductions in water quality (lake clarity and primary production) are expected to be short term. Water clarity would be reduced with inital flushes of ash and sediment, and then settle. Increased primary production would likely wane within 2-5 years.	Low	Closing Waldo Lake area; trail tread drainage stabilization, erosion control, riparian planting near lakeside, hillslope mulching	No treatment	Identified as an Outstanding Resource Water in Oregon due to unique and pristine water quality. Mostly within the Wilderness boundary. Majority of lake has low gradient slopes, including high SBS Charleton burn. Needle cast mulch layer may also help reduce probability of delivery in many areas surrounding Waldo Lake.
BAER critical value	Natural Resources - Soil and Water	Municipal Water at West Fir	Erosion, sediment, ash, debris flows	Unlikely	Measureable effects to municipality are not anticipated to be greater due post fire effects. Majority of the Middle Fork North Fork Willamette River corridor is in low or unburned soil burn severity; and the watershed is largely unaffected by the fire. Wide depositional zones between the burned area and municipality can help filter sediment/debris	Moderate	Reduced water quality could result in costly mitigations, or the need for alternative water sources	Low	Allow natural recovery	No treatment	Effects are expected to be short term due to rapid vegetation recovery rates in low soil burn severity.

BAER critical value	Natural Resources - Other	Waldo Lake-Geohazards	Debris flows	Possible	Debris flows in Waldo Lake are unlikely because of gentle slopes and surface roughness provides basins to collect sediment. Combined hazard debris flow model at 24 mm/hr indicates low and moderate debris flow hazards	Minor	Debris flows would be localized and recoverable	Low	Straw bales and wattles adjacent to the shoreline	No treatments	
Natural Resources- Fisheries and Wildlife											
BAER critical value	Natural Resources - T&E habitat	Chinook Salmon - CATCHMENT = North Fork of the Middle Fork Willamette	Habitat Degradation; Juvenile, Sub-adult, and Adult Mortality; Loss of viable spawning habitat	Possible	Accelerated sedimentation; Loss of stream shade; Potential for accelerated channel erosion; Loss of large wood	Minor	Pre-fire habitat condition was functioning fairly due to key features contributing to its resiliency. The North Fork Middle Fork Willamette contains the only available spawning grounds remaining upstream of Lookout Pont Reservoir and threatened Chinook utilize the reach for all life stages. The presence of an unburned buffer, low to moderate burn severity and proximity to a large amount of unconfined valleys reduce risk	Low	Refer to Hydrology (water quality), soils (sediment delivery), and geology (debris flow modeling) for potential treatment options	Refer to Hydrology (water quality), soils (sediment delivery), and geology (debris flow modeling) for potential treatment options	Impacts will be short term and localized; minimal debris flow potential in mainstem; spawning grounds located well downstream of high probability of debris flow and high burn severity; significant buffer along stream
BAER critical value	Natural Resources - T&E habitat	Chinook Salmon - CATCHMENT = Salt Creek	Habitat Degradation	Possible	Accelerated sedimentation; Loss of stream shade; Potential for accelerated channel erosion; Loss of large wood; predation	Minor	Lower magnitude of post-fire effects due to the absence of threatened spring Chinook salmon in any life stage	Low	Where road and related infrastructure has likely/very likely probability for damage or loss - refer to Hydrology (water quality) and Engineering	Refer to Hydrology (water quality) and Engineering related Critcal Values and treatments.	Some patches of moderate and high burn severity in Salmon Creek catchment. Chinook salmon currently do not occupy, spawn or rear in Salmon Creek. Goal - limit cascade of effects from post-fire increase in peak flow and associated debris flows by decreasing interaction with road and related infrastructure as well as toxicity issues related to burned buildings/homes.

BAER critical value	Natural Resources - T&E habitat	Bull Trout - CATCHMENT = Salt Creek	Habitat Degradation	Possible	Accelerated sedimentation; Loss of stream shade; Potential for accelerated channel erosion; Loss of large wood; predation	Minor	Short term fine sediment deposition, long term LWM and gravel recruitment, minimally utilized by bull trout and access to refugia outside of fire impacted reaches	Low	Refer to Hydrology (water quality), soils (sediment delivery), and geology (debris flow modeling) for potential treatment options	Refer to Hydrology (water quality), soils (sediment delivery), and geology (debris flow modeling) for potential treatment options	Bull trout have been know to utilize Salt Creek seasonally for migration and foraging, but in limited numbers.
BAER critical value	Natural Resources - T&E habitat	Bull Trout - CATCHMENT = Hills Creek Lake	Habitat Degradation; Juvenile, Sub-adult and Adult Mortality	Possible	Water quality impairment	Minor	Wilderness - species has evolved with different types of natural stocastic environmental events; species has an interconnected watershed with available habitat area outside of fire perimeter. An abundance of unconfined valleys lie upstream of the reservoir and may capture the majority of sediment	Low	Refer to Hydrology (water quality), soils (sediment delivery), and geology (debris flow modeling) for potential treatment options	Refer to Hydrology (water quality), soils (sediment delivery), and geology (debris flow modeling) for potential treatment options	Fish can seek refugia in Hills Creek reservoir and associated tributaries, and downstream in the mainstem Middle Fork Willamette .

BAER critical value	Natural Resources - T&E habitat	Bull Trout - CATCHMENT = North Fork Middle Fork Willamette	Habitat Degradation; Juvenile, Sub-adult and Adult Mortality	Possible	Accelerated sedimentation; Loss of stream shade; Potential for accelerated channel erosion; Loss of large wood predation	Minor	Wilderness - species has evolved with different types of natural stocastic environmental events; species has an interconnected watershed with available habitat area outside of fire perimeter. An abundance of unconfined valleys lie upstream of the reservoir. The presence of an unburned buffer, low to moderate burn severity and proximity to a large amount of unconfined valleys reduce risk.	Low	Refer to Hydrology (water quality), soils (sediment delivery), and geology (debris flow modeling) for potential treatment options	Refer to Hydrology (water quality), soils (sediment delivery), and geology (debris flow modeling) for potential treatment options	Fish can seek refugia in Hills Creek reservoir and associated tributaries, and downstream in the mainstem Middle Fork Willamette
BAER critical value	Natural Resources - T&E habitat and nest sites	Northern Spotted Owl Northern Spotted Owl Critical Habitat, Suitable Habitat, LSR and NSO Territories	Continued loss of habitat from post-fire stress, wind and storm events and post-fire insect and disease and disturbance from implementation of BAER activities during the nesting season.	Likely	Some high and moderate burn severity hence, trees will keep on dying and some disturbance us expected.	Moderate	Sixty-one owl territories were affected and may lose their viability due to future tree mortality. Thousands of acres lost in designated Critical Habitat units.	High	There are no treatments to stop future tree mortality.	There are no treatments to stop future tree mortality. However, seasonal restrictions for some BAER activities are recommended to avoid disruption of owls during nesting season March 1st - July 15.	Overall moderate and low severity fire with about 25% high severity. Sixty-one territories affected. Five Activity Centers lost a substantial amount of habitat and one has been deemed no longer viable. Consequence is thought High due to fire impacts on Activity Centers and potential future mortality.
Roads and Facilities											
BAER critical value	Life and Safety	All FS roads in Mod and High SBS	Hazard trees and rockfall	Possible	High mortality due to post-fire conditions and loose cut slopes causing rockfall	Major	Loss of life or injury to humans	High	Road Closure, Signs	**S1a.**Road hazards signs and **S2.** Physical Closure Devices	Roads in high and moderate soil burn severty are at risk of increased debris flow and rockfall potential. Main arterial roads will have gate closures.

BAER critical value	Property - Roads	FSR 24	High or Mod SBS catchments above culverts with plugging and diversion risk. High and mod SBS on slopes increasing risk of overwhelming ditches.	Likely	Culverts below burned channels will get increased flows, delivery of woody debris, and sediment, leading to plugging and possibly diversion. Increased debris and runoff on cutslope blocking and overwhelming ditches.	Major	Loss of paved system road requiring reconstruction. Isolated areas of rockfall and moderate debris flow hazards.	High	Stormproofing and Stormpatrol	**R1.** Stormproofing and **R3.** Stormpatrol	Isolated areas of rockfall and moderate debris flow hazards. Suppression will mitigate a portion of the danger trees.
BAER critical value	Life and Safety	Upper and Lower Kelsey Creek Bridge	Debris flow causing scour/attacking flow.	likely	Previous debris flows and area that model predicts high probability of debris flow	Moderate	Damage to bridge causing scour and compromising its integrity. Damage to channel due to scouring from attacking flow situation	High	Special Bridge inspection after storm/wet season prior to opening road	**R14.** (Other Road Treatment) Special bridge inspection after storm/wet season prior to opening road	Engineers completed the routine bridge inspection during the BAER assessment. Survey123 data was collected. Lower Kelsey on the 24 road and Lower Kelsey is on the 2418 road.
BAER critical value	Property - Roads	FSR (1931, 1934, 1938, 1944, 2421, 2417, 2420)	High or Mod SBS catchments above culverts with plugging and diversion risk. High and mod SBS on slopes increasing risk of overwhelming ditches.	Likely	Culverts below burned channels will get increased flows, delivery of woody debris, and sediment, leading to plugging and possibly diversion. Increased debris and runoff on cutslope blocking and overwhelming ditches.	Moderate	Loss of system road requiring reconstruction.	High	Stormproofing and Stormpatrol	**R1.** Stormproofing and **R3.** Stormpatrol	FSR 1931, 1944, 2417 and 2421 have isolated areas of rockfall and moderate debris flow hazards. Dry ravel observed on the 1944.
BAER critical value	Property - Other	Flat Creek Work Center	Flooding and compromising structures	Possible	Work center is built within a floodplain with a history of flooding. Hydraulic modelling results indicate that a high flow event with a 20% chance of occuring in a given year may spill into the work center	Moderate	Numerous structures present, including government housing and storage facilities. Property damage at FS isn't expected to seriously damage FS facility.	Intermediate	No Treatment	No Treatment	Debris flow is unlikely probability of damage or loss and minor magnitude of consequence, therefore there is a low risk to critical value. New engine bay facility and seed storage is housed in the warehouse that would be detrimental to botany resources. No Historic facilities present, they were removed after 2013 Decision Notice.

BAER critical value	Life and Safety	Personnel working or housed in quarters- Flat Creek Work Center	Flooding and compromising ingress/egress	Possible	Work center is built within a floodplain with a history of flooding. Hydraulic modelling results indicate that a high flow event with a 20% chance of occurring in a given year may spill into the work center. Road access potentially overtopped at higher end of the predictions	Major	Flooding may cause loss of life or injury to humans.	High	**S1b.** Sign TH to warn users of hazards	**S1b.** Sign to warn users of hazards	Potential to work with the National Weather Service to develop an early warning system for Salmon Creek.
Natural Resources- Botany											
BAER critical value	Natural Resources - Native Plants	Native plant community, R6 Sensitive species habitats, Special Habitats (SHABS)	Introduction and spread of high priority noxious weeds & habitat degradation	Very Likely	High priority noxious weeds occur along most major road corridors within the fire perimeter. When adjacent plant communites are burned over at moderate and high severity, seeds from noxious weeds can aggressively spread off roads into newly burned areas inhibiting natural regeneration and shifting species composition from native to non-native. R6 listed plants and their associated special habitats are succeptible to infestation by invasive plant species that are wind blown, animal or recreationalist dispersed.	Moderate	Noxious weeds do not provide the same ecosystem services for wildlife as native plant communities, lowers diversity, and inhibits natural sucessional processes. If R6 Sensitive species habitats or SHAB's become infested with invasive species it will alter the habitat and displace these rare listed species.	VERY HIGH	Seeding along road shoulders where invasives are nearby and moderate to high severity burn (black) meets the road. EDRR monitoring and treatment in special habitats and special status species populations.	**P1a.** Invasives EDRR	Loss of canopy from fire and exposed soil will further exacerbate most invasives, Scotch Broom. Longer term restoration will potentially be funded by the BAR program (additional treatments, seeding ect).

BAER critical value	Natural Resources - Native Plants	Native plant community: adjacent to **supression** activities	Introduction and spread of high priority noxious weeds	Very Likely	New dozer lines and roads that were bladed and brushed for containment lines likely spread noxious weed seeds in the seed bank while removing native vegetation allowing noxious weeds to spread to newly disturbed ground without competing understory vegetation	Moderate	Noxious weeds if not treated within the first year will spread along dozer lines and road shoulders used as containment lines and spread further into native plant communties	VERY HIGH	EDRR / seeding with natives along exposed roadshoulders	**P1b.** Invasives EDRR-Suppression: EDRR dozer lines and road section where supression activities created bare ground suseptible to invasion by noxious weeds.	
BAER critical value	Natural Resources - Native Plants	Native plant communities by trailheads and campgrounds	Introduction and spread of high priority noxious weeds from trailheads and campgrounds	Very Likely	Recreationists bring weed seeds in on vehicles to campgrounds and carrying seeds on boots, pets and livestock dispersing them along trails which when burned can colonize quickly	Moderate	trails and other high use rec sites are known hot spots for introducing and spreading noxious weeds	VERY HIGH	EDRR; closing campgrounds and trails	**P1a.** EDRR at trailheads and first 3-5 miles	
BAER critical value	Natural Resources - Native Plants	Native plant communities : Waldo Lake and Three Sister Wilderness	Introduction and spread of high priority noxious weeds	Very Likely	Recreationists bring weed seeds in on vehicles to trailheads and carry seeds on boots, bikes and livestock dispersing them along trails which when burned can colonize quickly.	Moderate	Wilderness special desgination untrammeled noxious weeds will degrade this condition	VERY HIGH	EDRR; closing Waldo Lake and trails	**P1a.** EDRR at trailheads and first 3-5 miles	
BAER critical value	Natural Resources - T & E Plant	White Bark Pine (WBP) Habitat - Candidate species for listing under the Endangered Species Act currently under review by FWS.	Invasive species introduction & habitat degradation	Likely	Suppression activities occured in this area and there is high probability of invasive species introduction.	Moderate	If white bark pine habitat becomes colonized by annual grasses or other invasives there will be a reduction in seedling recruitment sites.	High	EDRR, Seeding with native bunchgrasses in specific sites to establish natives and prevent invasives from colonizing critical habitat.	**P1a.** Invasives EDRR **P4.** T&E Seeding	**EDRR** treatment for high priority invasive plants, **Preventative seeding** with native species where trails within the habitat burned with high intensity and priority invasives are nearby; Longer -term restoration will potentially be funded by the BAR program; Mapped WBP habitat is a candidate for federal listing and the Middle Fork district already had plans for planting WBP.
Cultural Resources											

BAER critical value	Cultural Resources	North Waldo Snow Survey Cabin	Exposure of archaeological resources	Unlikely	Cabin was not wrapped and burned during fire	Moderate	Loss of historic archaeological data	Low	No treatment	**No Treatment**	The former cabin is located in the North Waldo recreation area and closure would help protect cultural resources
BAER critical value	Cultural Resources	Spring Pairie Shelter (Heritage Asset)	Fire Weakened Trees impacting the structure	Likely	High mortality due to post-fire conditions around structures	Moderate	Structural damage or loss of infrastructure (heritage asset)	High	Fall hazard trees threatening infrastructure (guard station and outbuildings)	**S3. Hazard tree felling**	The trail shelter is a Cultural Resource (eligible on NRHP); Treatment would be covered under recreation report.
BAER critical value	Cultural Resoures	Klovdahl Bay/Tunnel	Looting of exposed site constituents	Likely	Stand replacement fire has exposed site	Minor	Damage to or loss of eligible site constituents	Low	No treatment	**No Treatment**	This site is **eligible** for listing on the NRHP; needs field assessment as to risks to critical values.
BAER Critical Value	Cultural Resources	Various Heritage Assets	Erosion/Exposure	Possible	Many of the site are on ridge tops, and not in valley bottoms	Moderate	Damage to or loss of eligible site constituents	Intermediate	H1. Heritage and Cultural Resource Protection	No Treatment	Twenty-Seven cultural resource sites appear to be located within High Burn Severity classification; will assess remotely using GIS and Site Records to estimate Threats to Critical Values. Many are located along ridgetops and assuming other than potential exposure, likelihood of debris flows etc. would be minimal. Exposure now would likely be mitigated by natural vegetative recovery, so a closure would mitigate exposure. These sites is eligible for listing on the NRHP; Sites 06180800139 (White Mule Lithic Scatter, 06180800084 (Black Creek Rockshelter), and 06181000353 (Black Saddle Rock Cairn).

B. Emergency Treatment Objectives:

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 **(P1a, P1b, P4).**

Note - No active land treatments are recommended for long-term soil productivity. Allowing for natural recovery is the recommended course of action.

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, R3, T1**).
2. Reduce sedimentation into streams degrading water quality important for T&E Fish species (**R1, R3, T1**).
3. Protect bridge infrastructure having a special bridge inspection to ensure bridges continues to function due to high risk of debris flow near Kelsey Creek. The function of these bridge also is critical for future access to other BAER implementation. (**R14**)

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 and trailheads. (**S1a, S1b**)
2. Prevent access to public by placing gates thus ensuring public safety immediately following the fire. (**S2**)
3. Posting of hazard warning signs along various forest service roads and trails to warn users of potential hazards resulting from post-fire conditions (**P1a, P1b, P2**)
4. Protection of Forest Service investments, heritage sites and recreation infrastructure (**S3**).

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: 90
Channel: N/A
Roads/Trails: 80
Protection/Safety: 80

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land	80	85	90
Channel	N/A	N/A	N/A
Roads/Trails	80	85	90
Protection/Safety	80	90	90

E. Cost of No-Action (Including Loss): Approximately **$4,600,000** based on road and trail reconstruction, expansion of invasive weeds, and damage and loss of FS facilities, critical habitat, and cultural resources. Cost of injuries to public and personnel and loss of municipal drinking waters were not quantified.

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

☒ Soils ☒ Hydrology ☒ Engineering ☒ GIS ☒ Archaeology
☒ Weeds ☒ Recreation ☒ Fisheries ☒ Wildlife

☒ Soils ☒ Hydrology ☒ Engineering ☒ GIS ☒ Archaeology
☒ Other: Geol

Team Leader: Kyle Wright
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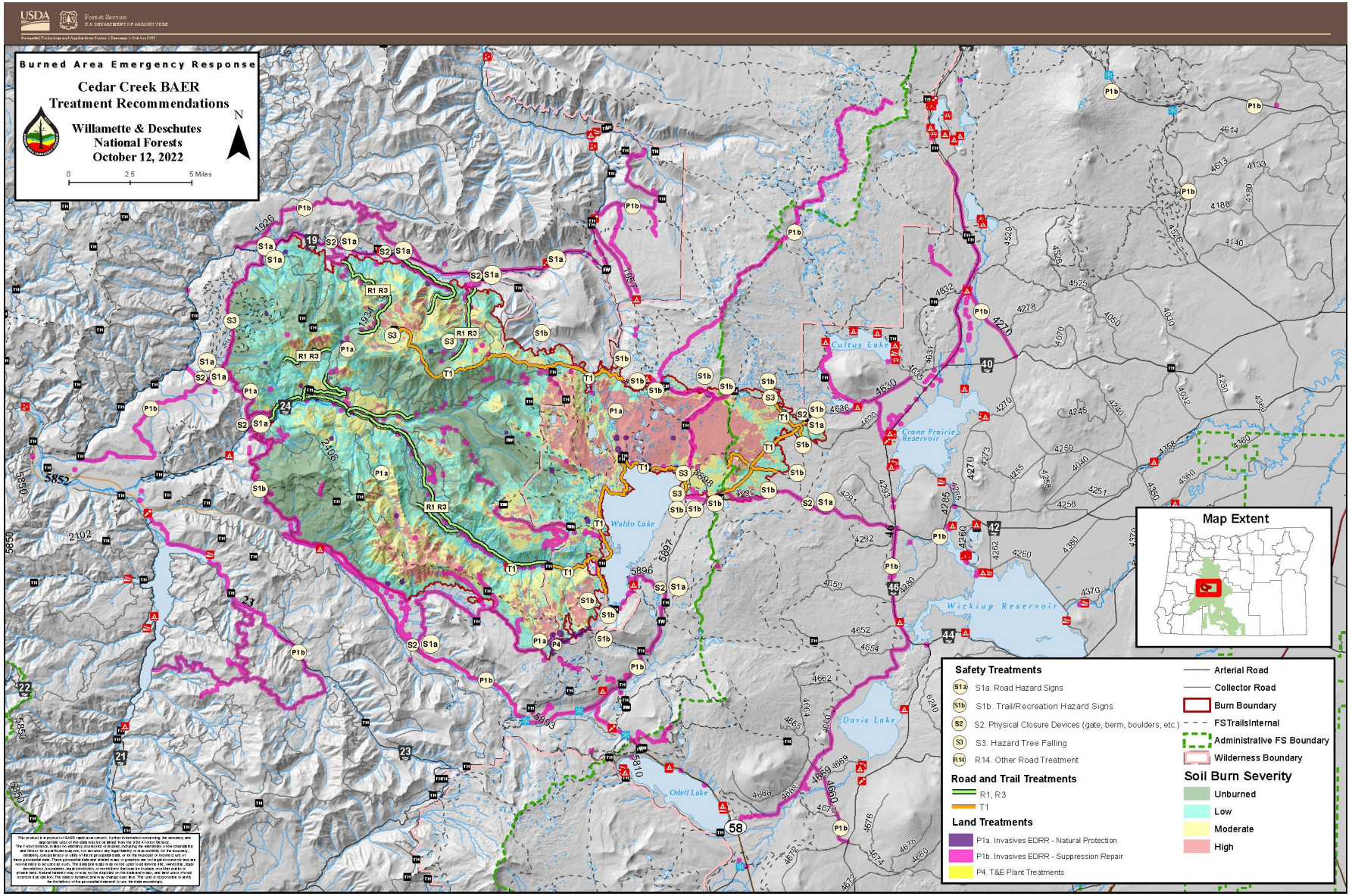
Forest BAER Coordinator/Team Leader: Lowell Evans
Email: lowell.evans@usda.gov Phone(s): 541-214-4625

Team Members: *Table 7: BAER Team Members by Skill*

Skill	Team Member Name
Team Lead(s)	Kyle Wright, Alex Rozin, Lizeth Ochoa (t), Lowell Evans
Soils	Sarah Hash, Mike Natharius, Wendy Peterman
Hydrology	Hazel Wood, Mac Cherry (t)
Engineering	Justin Nettleton, Mario A. Isaias-Vera(t)
Geology	Bart Wills, Derek Beal, Jered Hogansen
Fisheries	Casey Schuder(t)
GIS	Dorothy Thomas, Maureen Durrant(t), Austin Yu(t)
Archaeology	Paul Claeyssens
Botany	Krista Farris, Sarah Uebel (t), Sienna McDonald (t), Mike Crumrine (t), Sarah Uebel
Recreation	Kevin Rowell, Paul Patrikus(t), Nathan Shurtz(t), Hannah Kinville(t)
Wildlife	Esmeralda Bracamonte
PIO	Jaimie Olle(t), Kassidy Kern
Fire Liaisons	Guillermo Sereno, Erica Zacek

H. Treatment Narrative:



Land Treatments

P1a. / P1b. Invasives EDRR and Invasives EDRR Suppression: Early detection and rapid response (EDRR) surveys will focus on areas where unimpaired native plant communities (that burned at high or moderate soil burn severity) have known State of Oregon listed noxious weeds adjacent to them, as well as areas disturbed by fire suppression activities. EDRR will be used to minimize the potential for new noxious weed infestations and ensure the natural recovery of native vegetation. EDRR treatments (P1a.) are proposed for special habits and R6 listed plant habitat that burned with greater than 50% vegetation mortality and nearby high priority noxious weeds. Heavy equipment used for suppression activities travelled through areas of known weed populations to unaffected areas, which substantially increased the risk of noxious weed spread in these disturbed areas. Detection and treatment of new and existing noxious weed infestations will reduce the likelihood of spread to disturbed areas and allow for the re-establish of native and naturalized plant communities. EDRR treatments (P1b.) are proposed for suppression activities that created significant ground disturbance. Invasive plants of concern include false brome, Armenian blackberry, spotted knapweed, geraniums, Canada thistle, Scotch broom ventenata, tansy ragwort and St Johnswort. All of these are on Oregon Department of Agriculture's List of Noxious Weeds.

Treatment	Units	Unit Cost	# of Units	Total Cost
P1a. Invasives EDRR (WIL)	Acres	$150	346 total (182 new)	$51,900
P1b. Invasives EDRR-Suppression (WIL)	Acres	$150	541	$81,150
P1b. Invasives EDRR-Suppression (DES)	Acres	$150	181	$27,150

P2. Protection of Important native plant community: There is one site identified as critical habitat for White bark pine in the Cedar Creek Fire which burned with moderate and high severity and is at risk of habitat degradation if not surveyed and treated for noxious weeds. There was fireline dug through the critical habitat and it is likely that firefighters introduced noxious weed seeds on their equipment which can spread to freshly burned areas. We are proposing to seed a native bunchgrass Roemer's fescue in these freshly burned areas close to the disturbance to reduce the risk of noxious weeds spreading throughout the critical habitat. Although this species is currently a candidate for listing as threatened its status is imminent, as listing is expected to occur by the end of the calendar year.

Treatment	Unit	Unit Cost	# of Units	Total Cost
P2. Protection of Important native plant community WIL	Acre	$150	0	$0
P2. Protection of Important native plant community WIL	Lum	$1,000	0	$0

Channel Treatments: None

Roads and Trail Treatments:

Only those FS roads within or below areas burned at moderate or high Soil Burn Severity and have increased risk of damage due to post-fire conditions are recommended for Burn Area Emergency Response. Proposed treatments are designed to maintain and improve flows at drainage crossings and along adjacent slopes in order to remove higher levels of runoff from roads before extensive damage or loss of infrastructure can occur. Road treatments were designed to be practical and economical to mitigate risk to acceptable levels. See treatment map for locations of recommended treatments. The Soil Burn Severity even in areas that were mapped unburned and low still have severe vegetation consumption in the understory that is underrepresented in the SBS map.

R1. Storm proofing: Storm proofing drainage features identified for critical value roads that are susceptible to damage or failure due to increase post-fire flows. Activity will include cleaning culverts, ditches, catchment basins, and lead-out ditch capacity where they exist, road berm or ditch slump removal, and sediment and debris.

Treatment	Unit	Unit Cost	# of Units	Total Cost
Storm Proofing: Clean Corrugated Metal Pipes, Catch Basins and Ditches (This task includes FS Roads: 1931, 1934, 1938, 1944, 2400, 2417, 2420, and 2421)	Mile	$4,067	35	$142,345
Storm Proofing: Clean Corrugated Metal Pipes, Catch Basins and Ditches (This task includes FS Roads: 24 road)	Mile	$4,203	7	$29,421

R3. Storm Inspection and Response: Due to the predicted increase in debris laden flows in drainages in the burned area, and probability of culverts plugging, it is essential to monitor flows and address plugged culverts prior to any potential damage to the road prism. Before and immediately upon receiving heavy rain and/or spring snowmelt, FS personnel or contractors should survey the roads within the fire perimeter. This survey is intended for inspection of road surface conditions, ditch erosion, and culverts/inlet basins for capacity to accommodate runoff flows. Observations of rocks and sediment causing washouts and plugged culverts are identified and corrected before they worsen or jeopardize forest roads and associated infrastructure. The inspecting personnel may bring heavy equipment necessary to facilitate the removal of any obstructions from the roads and culvert inlets and catch basins where necessary. All excess material and debris removed from the drainage system shall adhere to the side casting as reviewed by Forest/District Specialists. All work to be performed shall conform to FP14-Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects and Forest Service Supplements. It is recommended to install “snow” poles or road markers to help in locating the culvert inlets/outlets if they become plugged. This work may be accomplished through Forest Maintenance Contracts or FS crews.

Treatment	Unit	Unit Cost	# of Units	Total Cost
Storm Inspection and Response(This task includes FS Roads: 1931, 1934, 1938, 1944, 2400, 2417, 2420, and 2421)	Mile	$800	42	$33,600

R14. Other Road Treatments - Special Bridge inspection: Kelsey Creek has a history of debris flows. Due to the risk of damage from the flow and altered channel increasing scour risk a special inspection after the wet season is recommended. This consists of a bridge inspection team coming out and looking at the bridges after the wet season prior to opening the road. Special attention should be paid to the channel, substructure and scour development or new scour risk due to altered channel conditions.

Treatment	Unit	Unit Cost	# of Units	Total Cost
Special Bridge Inspection	Each	$750	2	$ 1,500

T1. Trail Drainage: Of the 142 miles of trail in the fire perimeter, 18 miles of trail will require drainage treatments due to increased water compromising trail tread. Work will include installing drainage (rolling grade dips, grade reversals), step-down drain installations (armored drainage crossings), restoring out slope, re-establishing tread, replacing damaged retaining structures where necessary, and snagging trees as appropriate for worker safety. Trail crews will need to hang flagging to re-locate the trail in areas where the trail is difficult to follow. The flagging will be there to provide a safe route for the trail drainage crew, so they do not get lost.

Treatment	Units	# Of Units	Unit Cost	Total Cost
T1. Trail Drainage				
Trail Name & Number				
Deschutes	5.4 miles			$13,500
Lily Lake 19-3	Miles	0.5	$2500/mile	$1250
Charlton 19	Miles	2	$2500/mile	$5000
Lemish Lake 18	Miles	0.2	$2500/mile	$500
Clover Mdw 21	Miles	0.2	$2500/mile	$500
Metolius Windigo 99	Miles	2.5	$2500/mile	$6250
Willamette	16.3 miles			$40,750
Black Creek (3551)	Miles	3.5	$2500/mile	$8750
Jim Weaver Loop (3590)	Miles	4	$2500/mile	$10000
Blair Lake (3553)	Miles	4.5	$2500/mile	$11250
Joe Goddard's Grove (3690)	Miles	0.3	$2500/mile	$750
Additional Trails	Miles	7	$2500/mile	$16,500
Grand Total	**21.7**			**$61,000**

Protection/Safety Treatments:

S2. Road Closure: Closing roads is the safest and most effective treatment when a threat to human life has been identified. Roads can be closed where an alternative access exists. Closures are implemented with a signed forest order and must be enforced. Possible treatments include gates, jersey barriers, barricades, signs, and closure enforcement. Gates are highly effective, restrict public access, and help prevent threats to human life in unsafe areas and hazardous road conditions.

Treatment	Unit	Unit Cost	# Of Units	Total Cost
Install Gates-Single	Each	$5,750	7	$40,250
Install Gates-Double	Each	$10,000	2	$20,000

S1a. Warning Signs: Warning signs alert drivers and recreational users of existing or potentially hazardous conditions. Warning signs use universal symbols and follow *Sign and Poster Guidelines for the Forest Service (EM-7100-15)*. Signs identify immediate threats and may inform the public of access restrictions to affected areas.

Treatment	Unit	Unit Cost	# Of Units	Total Cost
Install Warning Signs	Each	$650	15	$ 9,750

S1b. Trail/Recreation Hazard Signs: This cost estimate is for placing information boards and posting hazard related signs to notify the public of post fire hazards and maintenance for one year (see recreation report for locations).

Treatment	Units	Unit Cost	# of Units	Total Cost
S1b. Trail/Recreation Hazard Signs	Sign/Post	$45	100	$4,500
S1b. Trail/Recreation Closure Signs	Sign/Post	$54	50	$2,700
S1b. Trail/Recreation Sign Installation	Per sign	$80	150	$12,000
Grand Total				**$19,200**

S3. Hazard Tree Felling: This treatment will mitigate hazard trees from falling and damaging Forest Service properties with significant economic value. such as large picnic shelters and toilets. Hazard tree felling for Spring Prairie Shelter is also proposed for protection for both the structure for recreation and as a cultural resource. In both North Waldo and Islet Campground several very expensive infrastructure concerns exists including: 6 composting toilets each costing $200,000, picnic shelters, amphitheater, and an expensive water treatment facility supporting both Campgrounds. All of the proposed hazard tree felling sites were visited during the assessment with the exception of Blair Lake Campground due to access safety concerns. There is a potential that the structures at Blair Lake were completely burned thus making this treatment unneeded.

Treatment	Units	# of Units	Unit Cost	Total Cost
S3 Hazard Tree Felling				
Deschutes				
Many Lakes Trailhead	Hazard Trees	20	$35	$1,400
Willamette				
Blair Lake Campground	Hazard Trees	100	$35	$3,500
North Waldo Campground	Hazard Trees	200	$35	$7,000
Islet Campground	Hazard Trees	200	$35	$7,000
Spring Prairie Shelter	Hazard Trees	10	$35	$350
Huckleberry OHV Area	Hazard Trees	50	$35	$1,750
Grand Total				**$20,300**

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

			NFS Lands				Other Lands			All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
P1a. - Invasives EDRR (WIL	Acres	150	346	$51,900	$0		$0		$0	$51,900
P1b. - Invasives EDRR-Supp	Acres	150	541	$81,150	$0		$0		$0	$81,150
P1b. - Invasives EDRR-Supp	Acres	150	181	$27,150	$0		$0		$0	$27,150
P2. - Native Plant Communit	Acres	150	0	$0	$0		$0		$0	$0
P2. - Native Plant Communit	Acres	1,000	0	$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$160,200	$0		$0		$0	$160,200
B. Channel Treatments										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
R1. Storm Proffing Level 3 a	Miles	4,067	35	$142,345	$0		$0		$0	$142,345
R1. Storm Proffing Level 5 R	Miles	4,203	7	$29,421	$0		$0		$0	$29,421
R4. Storm Inspection and Re	Miles	800	42	$33,600	$0		$0		$0	$33,600
RT. Other Road Treatments	Each	750	2	$1,500	$0		$0		$0	$1,500
T1. Trail Drainage	Miles	2,500	25	$62,500	$0		$0		$0	$62,500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$269,366	$0		$0		$0	$269,366
D. Protection/Safety										
S2. Road Closure (Single Ga	Each	5,750	7	$40,250	$0		$0		$0	$40,250
S2. Road Closure (Double G	Each	10,000	2	$20,000	$0		$0		$0	$20,000
S1a. Warning Sings (Roads)	Each	650	15	$9,750	$0		$0		$0	$9,750
S1b. Warning Signs (Trails)	Each	150	128	$19,200	$0		$0		$0	$19,200
S3. Hazard Tree Felling	Each	580	35	$20,300			$0		$0	$20,300
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$109,500	$0		$0		$0	$109,500
E. BAER Evaluation										
Initial Assessment	Report		Qualfied	$69,000	$0		$0		$0	$0
			Trainees	$57,000	$0		$0		$0	$0
Interim Assessment	Report		Qualified	$11,000	$0					
			Trainees	$5,000	$0					
Subtotal Evaluation				$126,000	$0		$0		$0	$0
F. Monitoring										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$539,066	$0		**$0**		**$0**	**$539,066**
Previously approved				$499,766						
Total for this request				**$39,300**						

PART VII - APPROVALS

Willamette Forest Supervisor Date

Deschutes Forest Supervisor Date