Date of Report: October 18, 2020

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: Beachie Creek Fire

B. Fire Number: OR-WIF-200299

C. State: Oregon

D. County: Marion and Clackamas

E. Region: 6

F. Forest: Willamette/Mt Hood NF

G. District: Detroit RD (WNF) & Clackamas River RD (MHNF), respectively

H. Fire Incident Job Code: P6NFN5 (0618)

I. Date Fire Started: August 16, 2020

J. Date Fire Contained: (est.) October 31, 2020

K. Suppression Cost: (est) $17.7 million (10/3/2020)

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

1. **Fireline repaired (miles):**
2. **Other (identify):** Approximately 0.3 miles of dozer lines and 0.2 miles of hand line were constructed on FS lands within the Beachie Fire. An additional 37.4 miles of existing roads were brushed, cleared, snagged or prepped as fire breaks. Suppression repair activities have started on these lines but completed mileage was not available at the time of this report.

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #12	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170900110104	Elk Lake Creek	17,181	31	0%
170900050303	French Creek-Detroit Lake	15,212	11,855	78%
170900050502	Headwaters Little North Santiam River	17,298	16,707	97%

HUC #12	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170900090402	Headwaters Molalla River	22,457	19,952	89%
170900050103	Humbug Creek	10,391	1,014	10%
170900050304	Kinney Creek-Detroit Reservoir	21,714	10,038	46%
170900050105	Lower Breitenbush River	9,203	550	6%
170900050505	Lower Little North Santiam River	10,020	9,826	98%
170900050403	Mad Creek-North Santiam River	13,541	10,533	78%
170900090202	Middle Butte Creek	14,318	6,016	42%
170900050504	Middle Little North Santiam River	13,779	13,779	100%
170900110102	Nohorn Creek	10,547	431	4%
170900090103	North Fork Silver Creek	19,429	3,180	16%
170900050501	Opal Creek	12,102	8,585	71%
170900090403	Pine Creek-Molalla River	23,952	16,416	69%
170900050402	Rock Creek	12,268	239	2%
170900050208	Sauers Creek-North Santiam River	8,700	45	1%
170900050401	Sevenmile Creek-North Santiam River	12,975	12,975	100%
170900050601	Stout Creek-North Santiam River	21,301	5,866	28%
170900090401	Table Rock Fork	23,227	1,715	7%
170900090404	Trout Creek-Molalla River	15,678	505	3%
170900090105	Upper Abiqua Creek	25,909	8,031	31%
170900090201	Upper Butte Creek	18,955	7,941	42%
170900110101	Upper Hot Springs Fork	10,217	144	1%
170900050503	Upper Little North Santiam River	19,206	19,206	100%
170900070201	Upper Mill Creek	13,842	686	5%
170900090302	Upper Rock Creek	14,427	47	0%
170900050404	Walker Creek-North Santiam River	17,899	6,535	37%

N. Total Acres Burned: as of 9/30/2020

Table 2: Total Acres Burned by Ownership

OWNERSHIP		ACRES
NFS		50,999
WILLAMETTE NF:	50,423 ACRES	
MT HOOD NF:	577 ACRES	
OTHER FEDERAL		39,057
BLM:	38,571 ACRES	
CORP OF ENGRS:	486 ACRES	
STATE		24,043
STATE:	24,043 ACRES	
PRIVATE		78,303
LOCAL GOVERNMENT		228
TOTAL		**192,631**

O. Vegetation Types: The vegetation types within the Beachie Fire perimeter are comprised in large part of Douglas-fir/Western hemlock (65%) Douglas-fir/true fir (13%), Mixed conifer (13%) with higher elevations dominated by true fir (1.6%) and mountain hemlock (0.6%). Understory vegetation varies by aspect, elevation and canopy cover, with Oregon grape (Mahonia nervosa), Salal (Gaultheria shallon) and Rhododendron (Rhododendron macrophyllum) being the most common shrub species under Douglas fir associations. Sword fern (Polystichum munitum), and Ocean spray (Holodiscus discolor) and vine maple (acer circinatum) under Western Hemlock, and White fir associations and at higher elevations primarily beargrass (Xerophyllum tenax), huckleberry (Vaccinium sp) and swordfern (Polystichum munitum). Non-forested sites comprise 5% of the fire area and make and include lava flows, 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 often comprised of unique plant communities which include rare or sensitive plant species.

P. Dominant Soils: Soils across FS lands in the Beachie Creek Fire tend to have sandy loam to loam surface textures and are largely derived from glacial deposits, colluvial materials, or residuum derived from tuffs, breccias, and basalts. Softer tuffs (and more clay-rich subsoil textures) are more prevalent in the eastern most areas of the Beachie Creek Fire. Most soils have volcanic ash in the surface layers, generally have high water holding and nutrient retention capacities, and are considered productive forest soils. Soils in the area north of Detroit (e.g. the Halls Ridge, Elkhorn Creek drainage, and Little North Santiam) tend to be “bony” with high rock content and frequent rock outcrop/scree slopes. Most common soil classifications are Andic Humudepts (Aschoff, Browder, Cadenza, Kinney, Zygore series) or Typic Haplocryands (Idanha, Hummington, Longbow, Oneonta, Battleax series).

Q. Geologic Types: Bedrock within the Beachie Creek Fire consists of Pliocene to Quaternary igneous extrusive rocks: basalt, basaltic andesite, dacite, and rhyolite. There are continental and marine sedimentary rocks located along the western margin of Beachie Creek burned area. Surficial deposits mostly are composed of unconsolidated alluvium, terrace deposits, fluvial glacial, glacial till, rockslide, landslide and debris flow deposits.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERRENIAL	614
INTERMITTENT	1,012
EPHEMERAL	0
OTHER (ARTIFICAL PATH)	76

S. Transportation System:

Trails: *National Forest (miles):* 49 *Other (miles):* 0
Roads: *National Forest (miles):* 118 *Other (miles):* 1,228

Table 4: Miles of Road by Maintenance Level

ROADS: NATIONAL FOREST TOTAL (MILES)	**118**
1 - BASIC CUSTODIAL CARE (CLOSED)	28
2 - HIGH CLEARANCE VEHICLES	76
3 - SUITABLE FOR PASSENGER CARS	13
4 - MODERATE DEGREE OF USER COMFORT	0
5 - HIGH DEGREE OF USER COMFORT	0
OTHER (MILES)	**1,228**

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 5: Burn Severity Acres by Ownership

Soil Burn Severity	NFS		Other Federal (List Agency)		State	Local Government	Private	**Total**	% within the Fire Perimeter
	Willamette	Mt. Hood	BLM	Army Corps					
Unburned	1,937	266	1,903	40	2,249	0	2,067	**8,462**	4.4%
Low	9,571	281	15,341	286	10,957	77	26,768	**63,280**	32.9%
Moderate	26,353	30	19,177	160	9,891	151	45,158	**100,921**	52.4%
High	12,561	0	2,150	0	946	0	4,310	**19,967**	10.4%
Total	**50,423**	**577**	**38,571**	**486**	**24,043**	**228**	**78,303**	**192,631**	

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	Total Acres of FS Lands*	Percent Total FS Lands
Severe	36,123	72%
Moderate	10,040	20%
Slight	3,561	7%
Not rated	541	1%
Grand Total	**50,265**	100%

Moderate and High SBS in Severe Erosion Hazard	Total Acres of FS Lands**
High SBS, Severe Erosion Hazard	9,468
Moderate SBS, Severe Erosion Hazard	19,679
Grand Total	**29,147**

D. Erosion Potential: Pre-fire erosion potentials are significantly less than one ton per acre per year. The average erosion potential for the 5-year storm across burned FS lands in the Beachie Creek Fire is about 16.0 tons per acre. The following erosion rates for selected HUC12 watersheds of concern were calculated from post-fire erosion models for a five-year storm in ERMiT (see Soils Report).

Beachie Creek Subwatersheds	5-Year Storm Mean Erosion Potential (tons per acre) for Burned Portions Only	5-Year Storm Mean Erosion Potential (tons per acre) for Entire Subwatershed
French Creek-Detroit Lake	17.4	14.4
Headwaters Little North Santiam River	21.4	20.7
Kinney Creek-Detroit Reservoir	15.4	7.1
Lower Breitenbush River	12.4	14.2
Opal Creek	17.5	12.4
Sauers Creek-North Santiam River	10.8	7.3
Upper Little North Santiam River	17.0	17.0

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 8.0 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): The Beachie Fire largely burned within the Little North Santiam and Upper North Santiam watersheds, with stand-replacing fire encompassing almost the entirety of the Cedar Creek and Elkhorn Creek drainages. Primary watershed response is expected to include an initial flush of ash and burned materials; rill and gully erosion in drainages and on steep slopes in the burned area; increased peak flows and sediment transport and deposition; and debris flows. These responses will likely lead to increased water quality concerns for municipal and domestic drinking water providers within and downstream of the fire. Modeled post-fire peak streamflow responses ranged from 2-3.5x pre-fire levels, depending on the proportion of moderate and high severity burn in the analyzed drainages. Watershed responses are dependent on the occurrence of rainstorm and rain-on-snow events and will likely be greatest with initial storm events. Disturbances will become less evident as vegetation is reestablished, providing ground cover that reduces erosion and increasing surface roughness to slow flow accumulation and increase infiltration.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Beachie Creek Fire started on August 16th, 2020 approximately 2 miles south of Jawbone Flats and approximately 6 miles northwest of Detroit, OR, on the Willamette National Forest. The fire primarily burned on NFS lands prior to making a significant run towards the west during an historic wind event on September 8th. This run spread the fire onto a significant portion of private, BLM and State managed lands. As of October 18, 2020 the fire was 193,573 acres and 80% contained, with an estimated containment date of October 31st, 2020. The BAER assessement started on September 28, 2020 with the final close-out completed on October 15th, 2020. The Critical Values spreadsheet in the project file summarizes critcal values evaluated and the risk assessment to identify where a BAER emergency exists that warrants treatment. The risk assessment focused on the most probable damaging storm events, which are typically longer duration wetting rains and/or rain-on-snow that occur in the fall or snowmelt in the spring.

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

Table 4: 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**

1. Human Life and Safety (HLS): Human life/safety is at risk on NFS land from threats associated with post-fire related hazard trees, rock fall, increased flooding and debris flows, and loss of egress/access throughout the burned area, but particularly on roads and trails. A fair number of Forest Service roads access private lands or communities and cannot be closed. Almost all of these roads have post-fire safety concerns that need to be addressed in some fashion to allow for safe travels (i.e. signage, culvert replacement, storm proofing).

Additionally, fire destroyed Forest Service and privately owned (under special use permit) facilities. The Detroit Rager Station Compound lost 7 structures in the fire. These burned facilities pose an immediate threat to humans and adjacent surface waters, many of which are domestic drinking water source areas or designated Critical Habitat for Threatened and Endangered Fish. Building ash is hazardous due to the known associated contaminates such as asbestos, lead-based paint and hazardous household waste.

2. **Property (P):** Damage to or loss of sections of road and trail could occur from increased runoff, erosion, flooding, and potentially debris flows within and downslope or downstream of areas of moderate and high soil burn severity. Due to the intensity and size of the fire along with the number of downed trees and rockfall, several roads and trails were not accessible for the team to survey. Known Forest Service roads impacted are the 2231, 2225 and the roads within the Detroit RS compound. Other roads such as the 2207, and 2209 were heavily impacted but could not be surveyed due to unsafe travel conditions including bridges that were fully consumed by fire. There are approximately 6 miles of trail are at risk of trail loss due to high and moderate burn severities upslope. Pre-fire, these were high use trails.

   Several Forest Service owned facilities (administrative, recreation and other) are at risk for additional damage due to hazard trees weakened the fire. Again, due to downed trees, debris and rocks in roadways, a lot of these structures were not accessible and could not be surveyed.

3. **Natural Resources (NR):**
   a. **Water quality** is a major post fire concern as elevated erosion rates and stream flows can impact drinking water supplies and associated filtration systems. The City of Salem's slow sand filtration system on the North Santiam River, just downstream of Mehama, is influenced by the highly impacted Little North Santiam River and is very susceptible to increased turbidity, organic matter, ash and other pollutants. Increased sediment and debris transport can also increase sediment loading and reduce water storage capacity in flood storage reservoirs. Critical Habitat for Upper Willamette Chinook and Steelhead is at risk to degradation with with increased fine sediment and reduced stream shading post-fire. Water quality managers in the North Santiam Basin are also considering the potential for increased harmful algal blooms due to sediment transport into Detroit Lake. Continued communication and coordination with partners and downstream users related to water quality is considered essential for relaying the BAER assessment findings, particularly with municipal water supply providers and the Army Corps of Engineers.

      The Beachie and Lionshead fires impacted source water drainages for numerous municipal and private domestic drinking water supplies. Downstream municipal users dependent on rivers originating in the fire area include: Salem, Stayton, Lyons, Mehema and Gates on the N. Santiam River, Idanha and Detroit which are reliant on the Rainbow and Mackey drainages, respectively, and Jefferson and Albany with intakes on the Santiam River. Private users include Breitenbush Hot Springs Resort, the N. Santiam Sportsmen Club, Opal Creek Ancient Forest Center, and residential intakes for recreational residences in the Stahlman and Breitenbush areas. Oregon State Parks and Recreation maintains a water intake

on Tumble Creek and several Forest Service Campgrounds rely on water from Mansfield Creek and other unnamed tributaries. Some of these intakes have been damaged in the fire and new systems will need to be developed. Other systems are at threat of degraded water quality or at risk of intakes and systems becoming clogged or damaged by high flows.

b. **Native and naturalized plant communities**, where invasive species or noxious weeds are absent or present in minor amounts, are at risk of invasion by known weed populations. Many of these weeds are on the State of Oregon's noxious weeds list and are adjacent to areas of high and moderate SBS, and areas disturbed by suppression activities. Noxious weed infestations pose a serious threat to the composition, structure, and function of native plant communities. Crown canopy was highly reduced to eliminated (moderate to high intensity burned areas); as was shrub and forb cover in the understory. These disturbed areas are now highly vulnerable to noxious weed spread from existing infestations or adjacent sources. Invasive plants of concern include False brome, Armenian blackberry, Spotted knapweed, Canada thistle, Scotch broom and Tansy ragwort.

c. **Threatened and Endangered Fisheries and Wildlife** species exist within the burn area. Species of concern include the Northern Spotted Owl, Upper Willamette Chinook and Upper Willamette Steelhead Trout. Thousands of acres of Northern Spotted Owl suitable habitat were converted to non-habitat, resulting in critical consequences. However there are no effective treatments to mitigate the impacts to the Owls at this point, other than following seasonal restrictions, where feasible, for activities that would adversely impact use of remaining viable habitat. Increased habitat degradation and juvenile and sub-adult mortality of Chinook salmon is possible due to accelerated sedimentation, loss of stream shade and large wood, and potential accelerated channel erosion in the North Santiam River. Road and trail related treatments will mitigate additional sedimentation due to road fill failures and lack of drainage capacity. Fish and wildlife specific actions are more long-term where strategic assessments are needed to inform actions. There are no specific treatment recommendations for fisheries at this point, other than those already recommended by hydrology, engineering and recreation (i.e. storm proofing road features, replacing culverts, storm inspection and response, road/trail stabilization).

d. **Soil Productivity** - Reduced ground cover, reduced infiltration, and altered soil structure following wildfire increases the risk of soil erosion and mass wasting. Human life and safety, infrastructure function and stability, stream function, fish viability, and soil productivity can all be threatened from sheet and rill erosion, debris flows, mass wasting, road slumping, and sediment delivery to streams. In some cases, these risks may persist for several years after the fire. While low SBS may increase the likelihood of soil-moving events, these events are most likely and most severe in areas of moderate to high SBS. Many of the landscapes within the fire area are prone to natural slope failures and debris flows. Some deep-seated landslides/slumps are also present. It is difficult to predict how fire will elevate the relative risk of these natural processes. Areas with high burn severity and high predicted hillslope erosion rates may result in sediment bulking/loading in debris flow-prone channels. Reduced surface cover and loss of slope stability due to root mortality may increase susceptibility to shallow rapid slope failures. Increased stream flows may impinge on the toeslopes of deep-seated earth flows, and when

combined with reduced slope strength associated with root mortality, may make large slumps more likely.

4. **Cultural and Heritage Resources:** Cultural resources at risk include traditional use areas, prehistoric lithic scatters, rockshelters, mining and railroad camps, mills and historic trails. Of those that qualify as BAER Critical Values, there are four sites that are at risk to looting and/or degradation from erosion.

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 (L1a, L1b).
2. Stabilize and disguise cultural sites in order to avoid the loss of site elements resulting from looting, vandalism, and/or erosion (L5b).
3. **Note -** No active land treatments are recommended for long-term soil productivity. Allowing for natural recovery is the recommended course of action. Landscape mulching/seeding treatments within feasible treatment areas were analyzed to determine whether a meaningful decrease in erosion/sediment delivery could be realized at the catchment scale. Data analysis found that Implementing mulching treatments would result in a small overall decrease in erosion of 0.5 to 1.5 tons per acre. Even where the greatest incremental decreases could be realized, the overall erosion rate would remain high. This minimal decrease it not significant enough to meaningfully protect long-term soil productivity in these drainages nor meaningfully reduce the amount of sediment delivered to waterways. Many areas have already experienced significant soil loss as a result of two major precipitation events that occurred in late September and mid-October. It is also likely that additional damaging storm events would occur before treatments could be implemented.

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 (RT1a, RT2, RT5, RT13).
2. Reduce sedimentation into streams egrading water quality important for T&E Fish species and municipal drinking water (RT1a, RT2, RT5, RT13).
3. Improve road crossing drainage by increasing ditch and catchment basin capacity and replacing burned up HDPE (High Density Polyethylene) culverts (only on roads that we cannot close due to access to private lands or cost-share roads) to reduce the potential for road failure due to increased flows (RT1a, RT5).

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. (P1a, P1b)
2. 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)

3. Protect worker and public safety by removing hazard trees associated with BAER treatments and within the vicinity of road, trail and hazardous material mitigation BAER treatment sites (RT5, RT13, P3a, P4, P5, P6).
4. Public outreach and education in combination with other closures and signs will be extremely important to ensure the safety to the public and to discourage trespass into hazardous terrain. The Opal Cr Wilderness area receives thousands of visitors every year and outreach and education is crucial to educating and keeping the public visitors safe. Outreach will include messaging to our partners, updates to Forest Service Websites and social media, and relevant press releases. (P10)
5. Protect employees and drinking water source areas from known exposed hazardous materials as a result of 7 burned Forest Service owned facilities (P3a, P5).
6. Protect downstream human life and property through facilitation and authorization (through special use permit) of the installation of early warning systems on NFS lands. (P10)
7. Protection of Forest Service investments and recreation infrastructure (P6, P3a).

Proposed Channel Treatments:

1. Information sharing and special use authorization of burned intake facilities on Forest Service lands for municipal water service providers including: City of Salem, Gates, Lyons, Mehama, Stayton, Mollala, and Mill City (C1).

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: 90
Channel: 85
Roads/Trails: 75
Protection/Safety: 90

D. Probability of Treatment Success

Table 5: Probability of Treatment Success

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

E. Cost of No-Action (Including Loss): Approximately **$753,000** 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): $169,172 ($288,172 including loss)

G. Skills Represented on Burned-Area Survey Team:

☒ Soils ☒ Hydrology ☒ Engineering ☒ GIS ☒ Archaeology
☒ Weeds ☒ Recreation ☒ Fisheries ☒ Wildlife
☒ Other: Facilities/Hazmat

☒ Soils ☒ Hydrology ☒ Engineering ☒ GIS ☒ Archaeology
PIO
BAER Liaison

Team Leader: Rob Tanner
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Forest BAER Coordinator: Fred Levitan
Email: frederick.levitan@usda.gov **Phone(s):** 541.731.2593

Team Members: *Table 6: BAER Team Members by Skill*

Skill	Team Member Name
Team Lead(s)	Rob Tanner
Assistant Team Lead(s)	Peggy Fisher, Kyle Wright, Dan Rife
Soils	Sarah Hash; Nori Koehler
Hydrology	Leah Tai, Jamie Sheahan-Alonso, Kacey Largent
Geology	Barton Wills
Engineering	Daniel Matthews, Cody Phillips, Chris Martin, Justin Nettleton, Bryan Kurtz
Facilities/Hazmat	Roger Bell
GIS	Dorothy Thomas, Ian Yau, Tara Mckinnon
Archaeology	Mike Boero
Weeds/ Botany	Krista Farris
Recreation	Josh Weathers, Brandon Haraughty
Fisheries	Richard Vacirca
BAER Liaison	Zachary Spears
PIO	Kassidy Kern
Wildlife	Joe Doerr, Esmeralda Bracamonte, Ruby Seitz

H. Treatment Narrative:

Land Treatments:
L1a. / L1b. 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. 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. Invasive plants of concern include False brome, Armenian blackberry, Spotted knapweed, Canada thistle, Scotch broom and Tansy ragwort. All of these are on Oregon Department of Agriculture's List of Noxious Weeds.

Treatment	Units	Unit Cost	# of Units	Total Cost
L1a. - Invasives EDRR	Acres	$130	143	$18,590
L1b. - Invasives EDRR-Suppression	Acres	$130	102	$13,260

L5b. Cultural Treatments (mulch/disguise): 4 sites in the Beachie Creek Fire area have been identified at risk of damage to or total loss of site elements resulting from looting, vandalism, and/or erosion. Treatment includes disguising/covering with local slash material, documentation of site conditions and consultation with State Historic Preservation Office (SHPO).

Treatment	Units	Unit Cost	# of Units	Total Cost
L5b. - Cultural Treatments (mulch/disguise)	Site	$1,430	4	$5,720

Channel Treatments:

C1. Source Water Protection: Special use reauthorization and access will be needed for drinking water providers to maintain burned intake structures on Forest Service lands. The drinking water service providers and have been impacted include: The Cities of Salem, Gates, Lyons, Mehama, Stayton, Mollala and Mill City. These systems will require coordination for access on NFS lands for maintenance and repairs of water systems.

Treatment	Units	Unit Cost	# of Units	Total Cost
C1. Source Water Protection	Days	$400	10	$4,000

Roads and Trail Treatments:

Only those FS roads and trails within or below areas burned at moderate or high SBS and have increased risk of damage due to post-fire conditions, are recommended for emergency response. Proposed treatments are designed to improve drainage at drainage crossings and along adjacent slopes in order to remove higher levels of runoff from trails and roads before extensive damage or loss of infrastructure can occur. Roads and trails were designed to be practical, economic treatments to mitigate risk to acceptable levels.

RT1a. Road Drainage (storm proofing existing drainage features): This treatment includes 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 and ditches, catchment basin and lead-out ditch capacity where they exist, road berm or ditch slump removal, and replacement of burn-out drop inlet covers as necessary to handle post-fire flows, sediment and debris**.** Includes FS Roads 2223, 2225.

Treatment	Units	Unit Cost	# of Units	Total Cost
RT1a. Road Drainage	Miles	$4,520	4	$18,080

RT2. Storm Inspection and Response: Storm inspection and response will keep culvert and drainage features functional by cleaning sediment and debris from in and around features between and/or during storms. Increase the frequency of storm inspections and availability of equipment to clean out culvert inlets based on local weather forecasts. This work will be accomplished through Forest Maintenance Contract, equipment rental, and general labor.

Treatment	Units	Unit Cost	# of Units	Total Cost
RT2. Storm Inspection and Response	Day	$2,000	10	$20,000

RT5. Culvert Modification: HDPE culverts (plastic) were damaged and/or destoyed as a result of the fire and need to be replaced to allow for user safety and to maintain a functional drainage system in order to protect surface waters from sedimentation. This treatment would only occur on roads that cannot be closed due to need for administrative access through the Detroit Ranger Station compound and access to PBA/PGE power lines.

Treatment	Units	Unit Cost	# of Units	Total Cost
RT5. Culvert Modification	Each	$5,600	2	$11,200

RT13. Trail Drainage: 6 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. Many of the trails up the Little North Fork Santiam will be assessed in the Spring when it is safer for workers.

Treatment	Units	# of Units	Unit Cost	Total Cost
RT13. Trail Drainage				
Trail Name & Number				
Mt. Hood				**$11,764**
Bagby #544	Miles	2.0	$5,882	$11,764
Willamette				**$23,528**
Beachie Saddle #3341	Miles	0.6	$5,882	$3,529
Piety Island	Miles	0.5	$5,882	$2,941
Tumble Ridge	Miles	2.9	$5,882	$17,058
Grand Total				**$35,292**

Protection/Safety Treatments:

Treatments are specifically designed to protect the public, employees, contractors and municipal waters from immediate threats as a result of the fire. Threats include hazard trees, rock fall, potential flood and debris flows, and hazardous materials.

P1a. Road Warning Signs: Signs will inform users of the dangers associated with entering and recreating within the burned area.

Treatment	Units	Unit Cost	# of Units	Total Cost
P1a. Road Hazard Signs	Sign/Post	$600	4	$2,400
P1a. Road Closure Signs	Sign/Post	$450	2	$900
			Total Cost	**$3300**

P1b. 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
P1b. Trail/Recreation Hazard Signs	Sign/Post	$70	40	$2,830

An additional $2,000 was previously funded in the Initial 2500-8.

P2. Road Closure Devices: Jersey Barriers will discourage public use of high risk areas due to the potential for post-fire risks associated with danger trees, flooding and other debris.

Treatment	Units	Unit Cost	# of Units	Total Cost
P2. Road Closure Device	Each	$650	4	$2,600

P3a. Hazard Tree (FS Facilities): Removal of hazard trees that have been weakened by fire and pose a threat to forest service owned facilities at Detroit Ranger Station compound and at Hall Ridge Communication Site.

Treatment	Units	# of Units	*Unit Cost	Total Cost
P3a. Hazard Trees - Detroit RS Compound	Each	20	$90	$1,800
P3a. Hazard Trees - Hall Ridge Comm Site	Each	20	$90	$1,800
			Total Cost:	**$3,600**

P3a. Hazard Trees (developed sites): Work will include removal of hazard trees in the immediate vicinity of areas where the public will congregate, predominately at trailheads that are not expected to be closed. The cost of hazard tree removal is estimated at an average $90 per tree, based on recent removal costs provided by local concessionaires (cost may be higher or lower per tree due to size, complexity and number of adjacent structures).

Treatment	Units	# of Units	Unit Cost	Total Cost
P3a. Hazard Trees -Trailhead				
Mt. Hood				**$450**
Whetstone	Hazard Trees	5	$90	$450
Willamette				**$9,450**
Battle Axe/Bagby/Beachie	Hazard Trees	5	$90	$450
Elkhorn Ridge	Hazard Trees	15	$90	$1,350
French Creek Ridge (FSR 2207)	Hazard Trees	5	$90	$450
French Creek Ridge (FSR 2225)	Hazard Trees	5	$90	$450
Henline Falls/Ogle Mtn.	Hazard Trees	5	$90	$450
Henline Mountain	Hazard Trees	5	$90	$450

Little North Santiam (FSR 2207)	Hazard Trees	5	$90	$450
Little North Santiam (FSR 2209-201)	Hazard Trees	5	$90	$450
Nasty Rock	Hazard Trees	20	$90	$1,800
Opal Gate	Hazard Trees	10	$90	$900
Opal Lake	Hazard Trees	5	$90	$450
Piety Island	Hazard Trees	5	$90	$450
Tumble Ridge (North)	Hazard Trees	5	$90	$450
Tumble Ridge (South)	Hazard Trees	10	$90	$900
Grand Total				**$9,900**

P5 – Hazardous Material (FS Facilities): Removal of hazardous materials that pose a threat to employee safety and contamination of surface waters. Treatment includes sampling and testing of the ash from the burnt buildings on the Detroit RD compound, disposal of ash consistent with the testing results and DEQ regulations, pumping of the septic tanks, and replacement of two (2) burnt HDPE culverts that lead to the equipment storage and powder houses for safe access of removal equipment.
$150K was previously funded in the Initial 2500-8. There is no additional request at this time.

Treatment	Units	# of Units	Unit Cost	Total Cost
P5. Hazardous Materials – FS Facilities				
Testing and removal of residence (known asbestos)	Each	4	$27,875	$111,500
Testing and removal of storage shed & detached garage	Each	3	$10,000	$30,000
Pumping existing septic tanks (Detroit RS)	Site	1	$2,500	$2,500
Mitigation of Hazard Trees	Each	20	$90	$1,800
WG10 Equipment Operator	Day	2	$450	$900
36” & 24” Galvanized culvert	Lump Sum	1	$800	$3,300
		Total Cost:		**$150,000**

P6. Infrastructure Protection: This treatment will mitigate hazard trees from falling and damaging Forest Service properties with significant economic value such as large picnic shelters and toilets.

Treatment	Units	# of Units	Unit Cost	Total Cost
P6. Infrastructure Protection				
Mongold Boat Launch	Hazard Trees	10	$90	$900

Three Pools Day Use Area	Hazard Trees	50	$90	$4,500
Pearl Creek Guard Station	Hazard Trees	50	$90	$4,500
Shady Cove Campground	Hazard Trees	50	$90	$4,500
Grand Total				**$14,400**

P8. Early Warning System Permitting and Support: This treatment provides support in the form of any required review and expedited permit processing for a cooperating organization to install a precipitation or stream stage monitoring device that would be installed to provide early warning of flooding to relevant agencies. Current interested agencies include, National Weather Service, USGS, Portland State University and Army Corps of Engineers. **$4000 was previously funded in the Initial 2500-8. There is no additional request at this time.**

Treatment	Units	Unit Cost	# of Units	Total Cost
P8. Early Warning System Permitting and Support	Days	$400	10	$4,000

P10. Public Outreach and Education: A large portion of the Beachie fire is proposed to be closed until it is reevaluated in the Spring. As a result there will be tremendous pressure for the Forest to open up recreation facilities that are extremely popular especially the Opal Creek area which receives thousands of visitors every year. Public outreach and education in combination with other closures and signs will be extremely important to ensure the safety to the public and to discourage trespass into hazardous terrain. Outreach will include messaging to our partners, updates to Forest Service Websites and social media, and relevant press releases.

Treatment	Units	Unit Cost	# of Units	Total Cost
P10. Other - Public Outreach and Education	Days	$400	16	$6,400

I. Monitoring Narrative:

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	RED FONT ITEMS WERE FUNDED IN INITIAL 2500-8										
L1a. Invasives EDRR	Acres	130	143	$18,590	$0						
L1b. EDRR Suppression	Acres	130	102	$13,260	$0						
L5b. Cultural Treatments	Site	1,430	4	$5,720							
Subtotal Land Treatments				$37,570	$0						
B. Channel Treatments											
C1. Source Water Protection	Days	400	10	$4,000	$0						
Subtotal Channel Treatments				$4,000	$0						
C. Road and Trails											
RT1a. Road Drainage	Miles	4,520	4	$18,080	$0						
RT2. Storm Inspection and Re	Days	2,000	10	$20,000							
RT5. Culvert Modification	Each	5,600	2	$11,200	$0						
RT13. Trail Drainage	Miles	5,882	6	$35,292							
Subtotal Road and Trails				$84,572	$0						
D. Protection/Safety											
P1a. Road Warning Signs	Each	550	6	$3,300	$0						
P1b. Recreation Warning Signs	Each	70	28	$2,000							
P1b. Recreation Warning Signs	Each	70	69	$2,830	$0						
P2. Road Closure Devices	Each	650	4	$2,600	$0						
P3a. Hazard Tree FS Facilities	Each	90	150	$13,500	$0						
P5. Haz Mat FS Facility	Lump	150,000	1	$150,000	$0						
P6. Infrastructure Protection	Each	90	160	$14,400							
P8. Early Warning Permitting	Days	400	10	$4,000							
P10. Public Outreach	Days	400	16	$6,400							
Subtotal Protection/Safety				$43,030	$0						
E. BAER Evaluation											
Initial Assessment	Report			$87,000	$0						
Subtotal Evaluation				$87,000	$0						
F. Monitoring											
Insert new items above this line!				$0	$0						
Subtotal Monitoring				$0	$0						
G. Totals				$325,172	$0						
Previously approved				$156,000							
Total for this request				**$169,172**							

PART VII – APPROVALS

1. _____ 10/23/2020

Forest Supervisor, Willamette National Forest Date

2. RICHARD PERIMAN Digitally signed by RICHARD PERIMAN Date: 2020.10.26 10:07:00 -07'00'

Forest Supervisor, Mt. Hood National Forest Date