

Date of Report: 9/10/2021**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 # \_\_\_\_\_  
 Updating the initial funding request based on more accurate site data or design analysis

**PART II - BURNED-AREA DESCRIPTION****A. Fire Name:** Cedar Creek**B. Fire Number:** WA-OWF-000320**C. State:** WA**D. County:** Okanogan**E. Region:** R6**F. Forest:** Okanogan – Wenatchee NF**G. District:** Methow Valley RD**H. Fire Incident Job Code:** P6N5J4**I. Date Fire Started:** 07/08/2021**J. Date Fire Contained:** est. 10/31/21**K. Suppression Cost:** \$38,319,000 (09/04/21)**L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

1. Fireline repaired (miles):
2. Other (identify):

**M. Watershed Numbers:***Table 1: Acres Burned by Watershed*

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
1702000802	Upper Methow River	120,978	14,903	12%
170200080203	Cedar Creek	19,656	7,472	38%
170200080204	Early Winters Creek	31,748	7,431	23%
1702000805	Twisp River	157,208	4,197	3%
170200080507	Middle Twisp River	21,865	158	1%
170200080508	Little Bridge Creek	15,599	3,940	25%

170200080509	Lower Twisp River	28,602	99	>1%
1702000806	Middle Methow River	248,595	36,148	15%
170200080602	Fawn Creek-Methow River	35,300	14,087	40%
170200080603	Wolf Creek	25,405	19,320	76%
170200080605	Thompson Creek-Methow River	28,469	2,741	10%

#### N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

Land Ownership	Total Acres
Private Land	753.85
State Land	943.15
U.S. Forest Service	53,550.52
<b>Grand Total</b>	<b>55,247.52</b>

O. **Vegetation Types:** Shrub steppe, Riparian Plant Communities, Hot and Dry Upland Forested Communities, and Dry and Wet Mixed Conifer Forested Communities.

P. **Dominant Soils:** Typic Vitricryands (5759.5 ac.), Loamy-skeletal, isotic, frigid Andic Haploxerepts (5697.5 ac.), Loamy-skeletal, isotic, frigid Vitrandic Haploixerolls (5260.4 ac.), Loamy-skeletal, isotic, frigid Vitrandic Haploxerepts (4239.9 ac.), Vitrandic Haploxerepts (4138.3 ac.), Loamy-skeletal, isotic Haploixeradic Haplocryepts (3451.1 ac.)

Q. **Geologic Types:** Mesozoic marine sedimentary rocks, Mesozoic continental sedimentary rocks, and Mesozoic volcanic rocks. Dominant surficial geology includes Upper Cretaceous mudstone and siltstone with chert-grained sandstone and conglomerate, Tertiary and Cretaceous shale, and Paleocene-Cretaceous subquartzose and quartzose sandstone.

#### R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

Stream Type	Soil Burn Severity					Grand Total
		High	Moderate	Low	Unburned	
Artificial Path	0	< 1	< 1	< 1	< 1	< 1
Canal-Ditch	< 1	1	1	< 1	2	
Intermittent	49	101	97	29	276	
Perennial	12	20	20	12	64	
Pipeline - Siphon	0	0	< 1	0	< 1	
Pipeline - Underground	0	< 1	< 1	0	< 1	

<b>Grand Total</b>	<b>61</b>	<b>122</b>	<b>118</b>	<b>41</b>	<b>342</b>
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**S. Transportation System:**

**Trails:** National Forest (miles): 74.5  
**Roads:** National Forest (miles): 53.6

Other (miles): Unknown  
 Other (miles): 2.9 (Okanogan Co), 4.8 (State)

**PART III - WATERSHED CONDITION****A. Burn Severity (acres):**

Table 4: Burn Severity Acres by Ownership

Land Ownership	Soil Burn Severity				Grand Total
	High	Moderate	Low	Unburned	
Private Land	1.52	139.97	553.86	58.50	753.85
State Land	1.19	165.65	664.60	111.72	943.15
U.S. Forest Service	8,162.75	18,031.78	21,312.12	6,043.88	53,550.52
<b>Grand Total</b>	<b>8,165.5</b>	<b>18,337.4</b>	<b>22,530.6</b>	<b>6,214.1</b>	<b>55,247.5</b>

**B. Water-Repellent Soil (acres):** All moderate and high soil burn severity and 10% of low soil burn severity (28,755 ac.)

**C. Soil Erosion Hazard Rating:**

Slight	6040.7
Moderate	37112.1
Severe	7600.5
Not rated	4429.5

**D. Erosion Potential:** pre-fire 0.1 tons/ac, post-fire 9.7 tons/ac

**E. Sediment Potential:** pre-fire 0.1 yds<sup>3</sup>/mi<sup>2</sup>, post-fire 5,643 yds<sup>3</sup>/mi<sup>2</sup>

**Debris Flow Potential**

The USGS provides estimates of debris-flow probability, approximate volume, and combined hazard for several storms with a range of 15-minute peak intensities. The peak 15-minute intensity of 32 mm/hr was used to evaluate risk to critical values in this BAER assessment. This rainfall intensity corresponds roughly to a 20% probability (five-year return interval) rain event.

Debris flow estimates are calculated at two scales: individual stream segments and drainage basins. The USGS debris flow model uses several parameters, including soil burn severity (SBS) data provided by the BAER team.

Additional information on the USGS debris flow model used for the Cedar Creek Fire is available at:  
[https://www.usgs.gov/natural-hazards/landslide-hazards/science/scientific-background?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/natural-hazards/landslide-hazards/science/scientific-background?qt-science_center_objects=0#qt-science_center_objects)

The model outputs are posted on the USGS public-facing webpage:

[https://landslides.usgs.gov/hazards/postfire\\_debrisflow/](https://landslides.usgs.gov/hazards/postfire_debrisflow/) which has an interactive map and downloadable geospatial data. The interactive map on the USGS website only allows the display of the 24 mmh<sup>-1</sup> peak 15-minute rainfall intensity rain event.

#### Summary of Observations:

- A storm event of 32 mm/h was predicted to have greater than 80% probability of debris flows in several drainages, including but not limited to many of the tributaries to Wolf Creek, several tributaries to the Methow River, several tributaries to Early Winters Creek, and two tributaries to Little Bridge Creek in the Twisp River drainage.
- The probability of debris flows is even higher in the Cedar Creek burned area in response to a 15-minute intensity of 40 mm/h, a rain event with roughly a 10-year recurrence interval.
- Most of these watersheds are roughly estimated to produce more than 1,000 m<sup>3</sup> of debris, resulting in a high debris flow hazard.
- Non-FS values within and downstream of the burned area may also be threatened by inundation from flooding and debris flows, including but not limited to homes on debris fans along the northeast face of the fire, homes on the Wolf Creek debris fan and on fans south of Wolf Creek, and State Highway 20.
- People and infrastructure near headwater channels with higher probability of debris flow occurrence are at risk of injury or damage from direct impact of debris and flood flows, as well as loss of egress from damaged roads.
- People and infrastructure along mainstem streams are vulnerable to flooding and debris flows as well, but are also vulnerable to elevated flooding when mainstem streams are blocked by debris flows from tributary drainages. A temporary debris dam can cause upstream flooding as waters pool behind the dam, and can cause catastrophic flooding downstream when the dam breaches. Streamflow flowing around a debris dam can also cause extensive lateral scour and incision elsewhere on the floodplain as water finds its way past the obstruction.
- The increased probability of debris flow activity will likely subside within 3-5 years following fire containment, as conditions within the burned watershed recover and hillslopes stabilize.

**F. Estimated Vegetative Recovery Period (years):** Estimated recovery of vegetation (sufficient to provide effective ground cover to significantly reduce hillslope runoff and erosion to levels closer to pre-fire conditions) is 3-5 years. Natural recovery of trees will take several decades.

**G. Estimated Hydrologic Response (brief description):** The fire has reduced or eliminated canopy and ground cover and has altered soil structure and caused varying degrees of hydrophobicity across extensive areas within the fire perimeter. These changes will lead to reduced precipitation interception and soil infiltration capacity, as well as elevated runoff compared to pre-fire conditions.

Watershed response will likely include an initial flush of ash and fine sediment, rill and gully erosion in headwater drainages and in small, steeper drainages within the burned area, debris-laden flash floods and debris flows in response to high-intensity rain events, as well as elevated snowmelt peak flows. Preliminary hydrologic modeling indicates flow increases in many headwater channels of >100X the pre-fire flow rates for a given storm. Water quality will be diminished during seasonal peak runoff, as well as after high-intensity summer rains, due to elevated ash, fine sediment, and nutrient loading. Elevated post-fire response will gradually diminish over time as vegetation and groundcover levels recover over the next several years, although some impacts are likely to persist for a decade or longer.

## PART V - SUMMARY OF ANALYSIS

### **Introduction/Background**

The Cedar Creek Fire began as a lightning strike on July 8, 2021. As of the date of this report the Cedar Creek fire perimeter includes 55,187 acres primarily on the Okanogan-Wenatchee National Forest. The fire left a mosaic of fire severity on USFS land, and included some large contiguous areas that burned with moderate to high soil burn severity. The BAER assessment was initiated on August 25, 2021.

The fire has burned within the Methow River drainage. Several headwater streams within the burned area have extensive fire impacts. Wolf Creek and its tributary Little Wolf Creek, which drain directly to the Methow River. Rader Creek drains to Patterson Lake, and Looney and Little Boulder Creeks along with a few unnamed tributaries flow off of the national forest and across private land to the Methow on the northeast face of the fire. Most of these streams have large diversions that greatly reduce summer flows to the river. Cedar, Pekin, Varden, and Silverstar Creeks flow to Highway 20 on the north side of the burned area. On the south side of the fire, Burnt Saw and Valentine Creeks drain to Little Bridge Creek, itself a tributary to the Twisp River.

Critical BAER values were assessed for post-fire threats to identify where an emergency exists that warrants treatment, and to identify the most cost effective treatments to minimize or mitigate post-fire threats. The critical value spreadsheet in the project file summarizes the values assessed and the level of risk to those values.

#### 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

#### 1. Human Life and Safety (HLS):

Human life and safety is at risk from threats associated with burned trees, rock fall, debris flows, flooding, and loss of egress/access throughout the burned area.

Probability of post-fire threats to life and safety were determined for several trails, roads and developed recreational facilities within the burned area. Separate ratings were determined for hazard trees and flooding/debris flows to better inform temporary closure treatment recommendations and future decisions about re-opening the closed roads, trails and facilities. For both hazard trees and flooding/debris flows, the BAER risk ratings for the roads, trails and facilities listed below generally ranged from possible to likely. In all cases, the magnitude of consequences was considered to be major, resulting in a high or very high risk rating.

Roads with high or very high BAER risk ratings for human life and safety due to the threat of direct injury or death or loss of egress from falling hazard trees and rocks as well as flash flooding and debris flows include all road segments within or immediately downslope of the burned area.

Trails with high or very high BAER risk ratings for human life and safety due to the threat of direct injury or death or loss of egress from falling hazard trees and rocks as well as flash flooding and debris flows include all trail segments within or immediately adjacent to or downslope from areas of low, moderate, or high soil burn severity.

Dispersed Camping with a *high* or *very high* BAER risk ratings for human life and due to the threat of falling hazard trees, rocks and/or the occurrence of flash flooding or debris flows. Risk ratings have not been completed for all dispersed camping locations within or immediately downstream from the burned area.

An emergency was determined for life/safety and BAER response actions, described in the treatments section of this report, are recommended.

#### 2. Property (P):

Loss of road and trail prisms and drainage system function could occur from increased runoff, erosion, flooding, and debris flows for road and trail sections within and downstream of areas of moderate and high soil burn severity. Risk ratings were determined for trails, roads and developed recreational facilities within the burned area. The probability of damage or loss was determined based on the likelihood and magnitude of damage from increased hillslope runoff to the road or trail drainage system as well as elevated flooding and debris flows leading to failure of stream-crossing structures. The magnitude of consequences was based on

the degree and extent of potential property damage. Several road segments were judged to be at high or very high risk of damage or loss due to post-fire conditions, and treatments have been recommended to reduce those risks. Similarly, several heavily used trails in good condition in the burned area were judged to be at *high* risk of damage or loss due to post-fire conditions based on their susceptibility to elevated runoff from moderate and high SBS terrain. Details on the trails, roads and road infrastructure risk assessment are in the BAER engineering and trails reports

### **3. Natural Resources (NR):**

**Soil Productivity and Hydrologic Function:** While post-fire erosion will have a negative effect on soil productivity and vegetative recovery, burned area soils will likely support the recovery of native vegetation, provided noxious invasive weeds do proliferate in the burned area. Hydrologic function will initially be impaired, particularly in areas of moderate to high soil burn severity. However, hydrophobicity will substantially diminish during spring snowmelt in the first year following the fire, and conditions affecting movement and storage of water will gradually recover in the coming years.

**Emergency Determination:** The probability of loss of soil productivity was estimated to be *very likely*, the magnitude of consequences was estimated to be *major*, and the risk *very high*. Nonetheless, BAER treatments are not recommended for soil productivity as landscape treatments across much of the burned area were determined not to be feasible or cost-effective. Treatments to maintain native plant communities will however contribute towards addressing post-fire impacts on soil productivity. The probability of loss of hydrologic function was estimated to be *very likely*, the magnitude of consequences was estimated to be *minor*, and the risk *low*.

**Water Quality:** Soil erosion and subsequent sedimentation increases are predicted throughout and downstream from the burned area. The cumulative effect of increased peak flows and sediment-laden runoff from the burned area increases the risk of degraded water quality within and downstream from the burned area. Beneficial uses of water include aquatic habitat as well as irrigation and other agricultural uses on private land, among others. The probability of loss of water quality was estimated to be *very likely*, the magnitude of consequences was estimated to be *moderate*; and the risk *high*. Given the risk rating, a variety of erosion/sedimentation control treatments were considered. However, no BAER treatments were recommended, as the low probability that such treatments would successfully reduce the risk to an acceptable level did not support treatment. Forest Service personnel will collaborate with partners to share information about burned area conditions to aid in informing local agencies and water managers about potential water quality degradation.

**Native or Naturalized Plant Communities:** Invasive plant infestations have been documented throughout the burned area prior to the fire. Noxious weeds, present throughout the road and trail corridors, may potentially spread on disturbed soils throughout the burned area. The potential for spread of invasive plants is highest in areas disturbed by suppression activities in areas with moderate to high soil burn severity. These areas are highest priority for treatment. Treatments are to limit the expansion of existing invasive plants within the fire perimeter.

The spread of noxious weeds would adversely affect multiple resources including native plant communities, the degradation of which in turn affects threatened and endangered species habitat for wildlife and fisheries, as well as soil productivity and hydrologic function. Forest Service policy mandates the Forest to minimize the establishment of non-native invasive species to prevent unacceptable degradation of the burned area.

**Emergency Determination:** The probability of loss of native plant communities was estimated to be *very likely* and the magnitude of consequence was estimated to be *moderate*; the BAER risk rating is *very high*.

#### **Wildlife: Critical TES Habitat or Suitable Occupied Habitat**

An assessment of post-fire threats to wildlife critical TES habitat was not completed at the time of the initial BAER request. Critical and suitable occupied habitat for NSO likely exist within the burned area. A BAER risk assessment will be completed on these resources as soon as is practicable in the fall of 2021.

### Fisheries: Critical TES Habitat or Suitable Occupied Habitat

An assessment of post-fire threats to aquatic critical TES habitat was not completed at the time of the initial BAER request. Critical and suitable occupied habitat for Bull Trout (*Salvelinus confluentus*), Chinook Salmon (*Oncorhynchus tshawytscha*) and Steelhead (*Oncorhynchus mykiss*) exist within the burned area. A BAER risk assessment will be completed on these resources as soon as is practicable in the fall of 2021.

#### **4. Cultural and Heritage Resources:**

An assessment of post-fire threats to cultural and heritage resources was not completed at the time of the initial BAER request. Several cultural or historic properties exist within the burned area. An assessment and BAER risk assessment will be completed on these resources as soon as is practicable in the fall of 2021.

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

- a. Reduce the post-fire risks to life and safety through administrative and physical closures of trails and roads, signing, and monitoring
- b. Storm-proof and stabilize roads and trails where feasible to protect the property investment and maintain access for administration and the public. Patrol roads during and immediately after rain events to clear debris from drainage structures
- c. Promote revegetation of native plant communities and soil stabilization through early detection/rapid response surveys and treatment to minimize the spread of State-listed noxious weeds.

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

**Land:** 90%

**Channel:** NA

**Roads/Trails:** 70%

**Protection/Safety:** 90%

#### **D. Probability of Treatment Success**

*Table 6: Probability of Treatment Success*

	<b>1 year after treatment</b>	<b>3 years after treatment</b>	<b>5 years after treatment</b>
<b>Land</b>	80	75	70
<b>Channel</b>	-	-	-
<b>Roads/Trails</b>	70	80	90
<b>Protection/Safety</b>	85	90	95

#### **E. Cost of No-Action (Including Loss):**

#### **F. Cost of Selected Alternative (Including Loss):**

#### **G. Skills Represented on Burned-Area Survey Team:**

- |  |  |   |   |                                      |
|--|--|---|---|--------------------------------------|
| <input checked="" type="checkbox"/> Soils      | <input checked="" type="checkbox"/> Hydrology  | <input checked="" type="checkbox"/> Engineering | <input checked="" type="checkbox"/> GIS | <input type="checkbox"/> Archaeology |
| <input checked="" type="checkbox"/> Weeds      | <input checked="" type="checkbox"/> Recreation | <input type="checkbox"/> Fisheries              | <input type="checkbox"/> Wildlife       |                                      |
| <input checked="" type="checkbox"/> Other: PIO |  |   |   |                                      |

**Team Leader:** Dave Callery

Email: david.callery@usda.gov

Phone(s): 406-439-5932

**Forest BAER Coordinator:** Molly Hanson

Email: molly.hanson@usda.gov

Phone(s): 509-306-5418

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

<b>Skill</b>	<b>Team Member Name</b>
<b>Team Lead(s)</b>	Dave Callery, Kit MacDonald
<b>Soils</b>	Kit MacDonald, Rob Ballard

Skill	Team Member Name
Hydrology	Molly Hanson, Greg Kuyumjian, Dave Callery
Engineering	Ken Bigelow, Lori McAllister
GIS	David Keenum, Susy Campbell
Archaeology	
Weeds	Kelly Baraibar, Kolbie Daley
Recreation	Suzanne Cable
Other	PIO: Jess Clark, Kevin Carns WA DNR: Trevor Contreras, Kate Mickelson NWS: Robin Fox

#### H. Treatment Narrative:

**Land Treatments:** Early detection/rapid response (EDRR) surveys will focus on areas of unimpaired native plant communities that burned at high or moderate soil burn severity and are adjacent to known state-listed noxious weeds, as well as areas disturbed by suppression activities. EDRR will be used to minimize the potential for new noxious weed infestations and ensure the natural recovery of native perennial grasses and forbs. Heavy equipment used for suppression activities travelled through areas of known weed populations to unaffected areas, which has substantially increased the risk of noxious weed spread in these disturbed areas. If new weed populations are found they would be promptly treated to minimize the potential to spread and resulting degradation of native plant communities. Chemical treatment of new and existing noxious weed infestations will reduce the likelihood of spread to disturbed areas and help re-establish high-quality wildlife and habitat within the burn.

Treatment	Units	Unit Cost	# of Units	Total Cost
L1a - Invasives EDRR	Acres	\$60	120	\$7,200
L1b- Invasives EDRR-Suppression	Acres	\$60	360	\$21,600

**Channel Treatments:** None

**Roads and Trail Treatments:** Treatments will reduce the risk of damage from elevated post-fire runoff on trails and roads by improving the number and efficiency of drainage features along segments within and below areas of moderate and high SBS. Stream crossings where there is a high probability of failure due to debris and sediment-laden flood flows will be modified to reduce the risk of damage to roads in the post-fire environment.

**R1. Road Drainage (stormproofing existing drainage features):** Road stormproofing involves cleaning or armoring of drainage structures to remove accumulated sediment and expand existing features to ensure drainage capacity prior to seasonal storms.

Treatment	Units	Unit Cost	# of Units	Total Cost
Road Drainage	mile	\$300	5	\$1,500

**R2a. New Drainage Dip:** Work will include the construction of drainage dips where gravel or native-surface roads were judged to be vulnerable to erosion due to inadequate drainage features.

Treatment	Units	Unit Cost	# of Units	Total Cost
Drainage Dip	each	\$3,100	8	\$24,800

**R3: Storm Inspection and Response:** Storm Inspection and Response will keep culverts and drainage features functional by clearing sediment and debris between storms to retain the effectiveness of these features.

Treatment	Units	Unit Cost	# of Units	Total Cost
Storm Inspection and Response	mile	\$3,000	4.7	\$14,100

**R5. Critical (Armored) Dip:** Work will include the addition of armored relief dips where culverts at stream crossings were judged to be vulnerable to plugging and failure. The dips will direct overflow across the road with minimal damage to the road surface and prism.

Treatment	Units	Unit Cost	# of Units	Total Cost
Armored Critical Dip	site	\$4,300	8	\$34,400

**R6. Culvert Modification:** Work will consist of adding a drop inlet structure to allow culvert to function even if inlet is plugged in peak flow event.

Treatment	Units	Unit Cost	# of Units	Total Cost
Drop Inlet	each	\$1,500	2	\$3,000
Lid for existing drop inlet	each	\$350	1	\$350
Cut off and remove damaged culvert outlet	each	\$600	2	\$1,200
<b>Total</b>				<b>\$4,550</b>

**R14. Other Road Treatment:** Road drainage is impaired in several locations where stumps or other woody material were buried in the road fill and burned out, leaving holes that could capture flow and lead to road failure.

Treatment	Units	Unit Cost	# of Units	Total Cost
Drainage restoration at stump holes	each	\$1,000	2	\$2,000

**R15. BAER Implementation Coordination:** The BAER implementation coordinator would ensure the treatments are completed within the one-year time constraint and coordinate with local personnel. This implementation coordinator will work on both Cedar Creek and Cub Creek 2 BAER implementation.

Treatment	Units	Unit Cost	# of Units	Total Cost
BAER Implementation Coordinator	day	\$400	15	\$6,000

**T1. Trail Drainage Stabilization:** Trail storm-proofing involves cleaning or armoring existing drainage structures to remove accumulated sediment, and add drainage structures to provide capacity for elevated post-fire runoff.

Treatment	Units	Unit Cost	# of Units	Total Cost
Backcountry Trails	mile	\$6,404	11.5	\$73,646
Front country Trails	mile	\$5,100	10.5	\$53,550

#### Protection/Safety Treatments:

**S1a. Road Hazard Signs:** This treatment will install burned area warning signs at key road entry points to caution forest users of burned area hazards and/or closures.

Treatment	Units	Unit Cost	# of Units	Total Cost
Burned Area Hazard signs, posts, hardware and installation	sign	\$700	7	\$4,900

**S1b: Trail/Recreation Hazard Signs:** This treatment will install burned-area warning signs at trailheads, boat ramps, and on trails intersecting the fire perimeter.

Treatment	Units	Unit Cost	# of Units	Total Cost
Signs for campgrounds and trailheads	sign	\$250	47	\$11,750

**S3. Hazard Tree Falling:** This treatment will cover the removal of fire-killed trees at risk of falling and damaging trailhead infrastructure, as well as reducing safety risk where visitor use is concentrated.

Treatment	Units	Unit Cost	# of Units	Total Cost
Hazard tree falling at Wolf Creek trailhead	site	\$1,474	1	\$1,474

**S6. Recreation Site – Waste Containment:** This treatment will pump vault of burned outhouse and seal surface openings at Wolf Creek trailhead.

Treatment	Units	Unit Cost	# of Units	Total Cost
Pump, treat and seal vault toilet	each	\$1050	1	\$1,050

**I. Monitoring Narrative:** Treatment monitoring will occur as part of the treatments for weeds, roads, and trails. No additional funding is requested for monitoring.

**PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS**

Line Items	Units	Unit	# of	BAER \$	Other \$
	Cost	Units			
<b>A. Land Treatments</b>					
L1a-Invasives EDRR	ac	60	120	\$7,200	\$0
L1b-EDRR-Suppression	ac	60	360	\$21,600	\$0
<i>Insert new items above this line!</i>					\$0
<i>Subtotal Land Treatments</i>				\$28,800	\$0
<b>B. Channel Treatments</b>					
<i>Insert new items above this line!</i>					\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0
<b>C. Road and Trails</b>					
R1-Road Drainage	miles	300	5	\$1,500	
R2a-Drainage Dip	each	3,100	8	\$24,800	
R3-Storm Insp/Resp, light	miles	3,000	4.7	\$14,100	
R5 Armored Critical Dip	each	4,300	8	\$34,400	
R6 Culvert Drop Inlet	each	1,500	2	\$3,000	
R6 Culvert Drop Inlet Lid	each	350	1	\$350	
R6 Cut Off Damaged Outlet	each	600	2	\$1,200	
R14 Stump Hole Repair	miles	1,000	2	\$2,000	
R15 Implementation Coordination	days	400	15	\$6,000	
T1 Backcountry Trail Drainage	miles	6,404	11.5	\$73,646	
T1 Frontcountry Trail Drainage	miles	5,100	10.5	\$53,550	
<i>Insert new items above this line!</i>					\$0
<i>Subtotal Road and Trails</i>				\$214,546	\$0
<b>D. Protection/Safety</b>					
S1a-Road Hazard Signs	sign	700	7	\$4,900	
S1b-Trail/CG Hazard Signs	sign	250	47	\$11,750	
S3-Hazard Tree Falling	site	1,474	1	\$1,474	
S6-Waste Containment	site	1,050	1	\$1,050	
<i>Insert new items above this line!</i>					\$0
<i>Subtotal Protection/Safety</i>				\$19,174	\$0
<b>E. BAER Evaluation</b>					
Initial Assessment		\$55,000	1	\$55,000	\$0
<i>Insert new items above this line!</i>				---	\$0
<i>Subtotal Evaluation</i>				\$55,000	\$0
<b>F. Monitoring</b>					
<i>Insert new items above this line!</i>				\$0	\$0
<i>Subtotal Monitoring</i>				\$0	\$0
<b>G. Totals</b>					
Previously approved					
Total for this request				\$262,520	\$0

**PART VII - APPROVALS**

Erich Waller  
Forest Supervisor

for Kristin M. Ball

9/10/21  
Date