Date of Report: 9/23/2021

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: Walker Creek

B. Fire Number: WA-NES-2245

C. State: Washington

D. County: Okanogan

E. Region: 6 Pacific Northwest

F. Forest: Colville

G. District: Tonasket

H. Fire Incident Job Code: PNN7RL (1522)

I. Date Fire Started: 8/3/2021

J. Date Fire Contained: estimated 10/31/2021

K. Suppression Cost: ~17 million dollars

L. Fire Suppression Damages Repaired with Suppression Funds (estimates): 1 million dollars

1. **Fireline repaired (miles): 14 miles estimated**
2. **Other (identify):**

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

Walker Creek				Soil Burn Severity							
Subwatershed Name	Total Subwatershed		Subwatershed Outside the Fire	Unburned or Very Low		Low		Moderate		High	
	Acres	% Burned	Acres	Acres	%	Acres	%	Acres	%	Acres	%
Beaver Creek 170200021202	20,189	6.0%	18,968	254	1.3%	363	1.8%	326	1.6%	278	1.4%
Upper Antoine Creek 170200061603	22,419	2.6%	21,836	63	0.3%	354	1.6%	163	0.7%	2	0.0%

Upper Bonaparte Creek 170200061702	38,455	35.4%	24,846	722	1.9%	7,017	18.2%	4,776	12.4%	1,093	2.8%
Upper Myers Creek 170200020902	27,385	12.5%	23,972	266	1.0%	1,650	6.0%	1,454	5.3%	43	0.2%
Upper Siwash Creek 170200061801	9,481	16.9%	7,876	43	0.5%	877	9.2%	586	6.2%	100	1.1%
Upper Toroda Creek 170200021203	32,168	9.4%	29,152	430	1.3%	2,112	6.6%	463	1.4%	11	0.0%
Grand Total	**150,097**	**15.6%**	**126,650**	**1,779**	**1.2%**	**12,373**	**8.2%**	**7,768**	**5.2%**	**1,528**	**1.0%**

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

Soil Burn Severity	Private	State	Forest Service	Grand Total	Soil Burn Severity %
High	53	5	1,470	1,528	6.5%
Moderate	876	272	6,620	7,768	33.1%
Low	3,660	611	8,102	12,373	52.8%
Unburned	470	55	1,254	1,779	7.6%
Grand Total	**5,059**	**942**	**17,446**	**23,447**	
Ownership %	21.6%	4.0%	74.4%		

O. Vegetation Types:
Pre-fire vegetation consisted largely of a higher elevation Subalpine-fir zone dominated by Lodgepole Pine, Subalpine fir, and Engelman Spruce. The lower elevations were dominated by Douglas-fir with some Ponderosa Pine. The highest elevations were larger rock scree and high elevation herbs and shrubs. Understories were dominated by alder, ceanothus, and service berry.

P. Dominant Soils: Manley Series, Nevine Series, Myerscreek Series, Louploup Series, Pettijohn Series

Q. Geologic Types:
Granite, quartz monzonite, quartz diorite, granodiorite, and trondhjemite. Includes diorite in southeastern Washington; diorite and gabbro near Concunully in Okanogan County; gneiss, schist, and migmatites in areas of Chelan, Colville, and Okanogan batholiths. Includes high-grade metamorphic rocks of Precambrian age in Spokane area. Includes significant portions, primarily orthogneiss, of the Kettle Metamorphic Core Complex and the Okanogan Metamorphic Core Complex, as well as orthogneiss in the Okanogan Batholith area. Metamorphic rocks near Spokane include quartzite and possibly meta-argillite and hornfels of Belt Supergroup (Stoffel and others, 1991). Colville batholith; Kaniksu Batholith (including Spirit pluton); Loon Lake granite; Mount Stuart granodiorite; Osoyoos granodiorite; Similkameen batholith; Whisky Mountain granodiorite; Cooper Mtn Batholith; Okanogan Batholith

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

Walker Creek	
Type	**Miles**
Intermittent Stream	46

Perennial Stream	18
Grand Total	**64**

S. **Transportation System:**
Trails:

Walker Creek	
Trail Class	**Miles**
3 - Highly Developed	12.8

Roads:

Walker Creek	
Operational Maintenance Level	**Miles**
1 - BASIC CUSTODIAL CARE (CLOSED)	18.8
2 - HIGH CLEARANCE VEHICLES	17.2
3 - SUITABLE FOR PASSENGER CARS	14.7
4 - MODERATE DEGREE OF USER COMFORT	0.2
Non-FS Roads	5.0
Grand Total	**56.0**

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	Private	State	Forest Service	Grand Total	Soil Burn Severity %
High	53	5	1,470	1,528	6.5%
Moderate	876	272	6,620	7,768	33.1%
Low	3,660	611	8,102	12,373	52.8%
Unburned	470	55	1,254	1,779	7.6%
Grand Total	**5,059**	**942**	**17,446**	**23,447**	
Ownership %	21.6%	4.0%	74.4%		

B. Water-Repellent Soil (acres): 4,780

C. Soil Erosion Hazard Rating:

Walker Creek		
Erosion Hazard	**Erosion Hazard (acres)**	**Erosion Hazard %**
Low	2,927	12%
Moderate	14,589	62%
High	5,055	22%
Very High	876	4%
Grand Total	**23,447**	**100%**

D. Erosion Potential: 26 tons/acre

E. Sediment Potential: 3,345 cubic yards/square mile

F. Estimated Vegetative Recovery Period (years): 3-5 years

G. Estimated Hydrologic Response (brief description): Hydrologic response following wildfire in the Walker Creek Fire burned area will include reduced interception and infiltration of precipitation, increased runoff and erosion, higher stream flow volumes for a given precipitation or snowmelt input, and a more rapid rise of stream and river levels compared with those of unburned conditions. Additionally, the probability of severe erosion, debris flows, and hillslope failure is substantially higher, and will remain so for at least the next few years.

Pour Points	Drainage Area (acres)	Burn Severity (Acres)				Pre-Fire Q5 (cfs)	Post-Fire Q5 (cfs)
		High	Mod	Low	Un-burned		
Upper Antoine Creek	22,419	2	163	354	63	176	179
Upper Myers Creek	27,385	43	1454	1650	266	203	221
Beaver Creek	20,189	278	326	363	254	138	147
Upper Taroda Creek	32,168	11	463	2112	429	293	307
Upper Bonaparte Creek	38,455	1093	4776	7017	722	322	419
Upper Siwash Creek	9,481	100	586	877	43	96.9	110

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Walker Creek fire was caused by lightning on August 3, 2021. Hot, dry weather, low humidity and drought conditions increased fire behavior causing it to quickly move and spread around the Bonaparte Mountain area on the Tonasket Ranger District. At its peak there was a fully staffed Type 2 Team supporting the fire suppression efforts. Please see Appendix A for embedded PDF maps of soil burn severity, treatment locations, and debris flow modeling.

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):

- Protect human life and safety of forest visitors through raising awareness of the risks present in a post-fire forested mountain setting by installing informational and warning signs at trail and road portals in and adjacent to the burned area.
- Protect human life and safety from post-fire hazards at selected trails and campgrounds through closure treatments and road gate installation
- Protect human life and safety from post-fire hazard trees at select trailheads for worker and public safety.
- Monitor the effectiveness of road and trail treatments and facilitate any needed maintenance of treatments during the first year following the fire.

Value	Probability	Consequence	Rating	Threat
Trails and Roads	Possible	Major	High	Some trails and roads go through moderate and high intensity burn areas and are prone to fire killed standing and down trees and is possible strategic road and trail closures may be needed.

2. Property (P):

- Reduce risk of road and trail infrastructure damage from elevated post-fire hillslope runoff and flood flows from FS land onto Private and State land.
- Reduce erosion and transport of fine sediment into area streams, and thus reduce impacts of road and trail network to water quality and aquatic habitat.

Value	Probability	Consequence	Rating	Treat
Pettijohn Creek culvert on 100 Road	Likely	Major	Very High	This culvert is undersized, plugged, and is currently ponding water behind it. Removing this culvert and fill to allow for potential elevated Spring run-off to occur is the best option to maintain the integrity of the 100 Road and protect the adjacent private property from flood damage. Retained receipts from the Forest may replace the culvert.
Pipsissewa Trail, Fourth of July Trail, Southside Trail, Cabin Trail, and Antoine Trail.	Likely	Major	Very High	Some portions of these trails go through moderate and high intensity burn areas and need drainage features to keep the trail in place and reduce erosion.

3. Natural Resources (NR):

- Foster the recovery of native plant communities, including sensitive species, in the burned area by minimizing the proliferation of noxious weed populations

Value	Probability	Consequence	Rating	Treat
Native and Natural Plant Communities	Very Likely	Moderate	Very High	Localized noxious and invasive weed populations exist immediately adjacent to the burned area and area disturbed by suppression. Plants will compete aggressively with native species for space and nutrients.

4. Cultural and Heritage Resources:

- An old mining site that is eligible for Historic Register was burned over and is at high risk for looting. It is recommended that a gate be installed on the 3240-130 road and a closure be put in place for at least one growing season so the site can be covered by native vegetation. The Heritage Staff will need 10 days for monitoring and site inventory in the spring/summer of 2022.

Value	Probability	Consequence	Rating	Treat

Historic Mining Site	Very Likely	Major	Very High	Sites occur in moderate to high burn severity areas and are fully exposed on an open Forest Service Road. Putting a gate at the 3240-130 road and put a closure in place for one growing season is recommended. 10 days of site inventory and monitoring are needed to assess looting concerns.

B. Emergency Treatment Objectives:

The objectives of the emergency treatments proposed in this document are to manage identified unacceptable risks from "imminent post-wildfire threats to human life and safety, property, and critical natural resources on National Forest System lands" (FSM 2523.02). The timely application of the proposed treatments is expected to substantially reduce the probability of damage to the BAER critical values identified in the section A, above.

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

Land: 95%
Channel: None proposed
Roads/Trails: 80%
Protection/Safety: 95%

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%	75%	70%
Channel	No treatments proposed in channel		
Roads/Trails	70%	80%	90%
Protection/Safety	85%	90%	95%

E. Cost of No-Action (Including Loss): $1,000,000 due to failure of 100 road

F. Cost of Selected Alternative (Including Loss): $27,686

G. Skills Represented on Burned-Area Survey Team:

☒ Soils ☒ Hydrology ☒ Engineering ☒ GIS ☒ Archaeology
☒ Weeds ☒ Recreation ☒ Fisheries ☐ Wildlife
☒ Other:
Range

Team Leader: Luke Cerise
Email: luke.cerise@usda.gove **Phone(s)** (509) 486-5108

Forest BAER Coordinator: Luke Cerise
Email: luke.cerise@usda.gov **Phone(s):** (509) 486-5108

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

Skill	**Team Member Name**
Team Lead(s)	Luke Cerise
Soils	Jason Jimenez, Colville NF Soil Crew
Hydrology	Andrea Traeumer, Mike Malon
Engineering	Lucy Reeves, Nate Peck
GIS	Chris Strobl, Abby Gettinger

Skill	Team Member Name
Archaeology	Stu Chilvers, April Miller
Weeds	Brandon Weinmann
Recreation	Betsy Peterson
Other	

H. Treatment Narrative:

Land Treatments:

L1a. Invasives EDRR - BAER: Early Detection and Rapid Response (EDRR) treatments are proposed for sensitive habitats and roadside areas (62 acres) within 200 feet of documented high priority weed infestations where the fire burned with moderate to high soil burn severity. These areas have a high probability of being invaded by non-native invasive plants.

L1b. Invasives EDRR - Suppression: Above and beyond the Incident Suppression Repair efforts, BAER EDRR treatments are proposed for dozerlines, drop points and other ground disturbing areas caused by fire suppression activities (16 acres) and will be essential to protect native and naturalized communities. The likelihood that heavy equipment working on the fire brought in propagules from outside the fire perimeter is high. Early detection and treatment will help prevent new invasive species from getting established in these disturbed areas. EDRR for suppression is proposed on 1.3% of the NFS acres within the fire perimeter. Most of the EDRR work is expected to go into an existing agreement with the Okanogan County Weed Board.

Walker Creek Invasives	
Common Name	**Acres w/in fire**
Canada thistle	13.5
cheatgrass	15.8
common St. Johnswort	154.7
diffuse knapweed	169.5
gypsyflower	30.4
hawkweed	7.1
hoary alyssum	0.2
meadow hawkweed	10.1
nodding plumeless thistle	33.7
orange hawkweed	96.7
oxeye daisy	0.3
spotted knapweed	12.1
sulphur cinquefoil	0.2
Grand Total	**544.3**

Item	Unit	Unit Cost	# Units	Total
EDRR Invasives BAER	Acres	$120/acre	62	$7,440
EDRR Invasives Suppression	Acres	$120/acre	16	$1,920
	Total Land Treatment Cost			**$9,360**

Channel Treatments:
No Channel Treatments are proposed.

Roads and Trail Treatments:
There are approximately 13miles of trail within the Walker Creek Fire on the Tonasket Ranger District. Of those miles 6.5 received high and moderate soil burn severity and 6.5 miles of low soil burn severity or unburned conditions.

Site	Units	Cost	# of Units	Total Cost
Pipsissewa Trail #383	miles	$2580	1 mile	$2580
Fourth of July #337	miles	$2580	2 miles	$5160
Southside #308	miles	$2580	2 miles	$5160
Cabin #303	Miles	$2580	1 mile	$2580
			Total Cost	**$15,480**

BAER team members assessed the first 0.5 miles of most trails in the fire area. Multiple burned snags and stump holes exist along these trails. Trail surveys found that soil burn severity levels and relative steepness were reasonable predictors of erosion potential. Fire burn severity is used to determine trail stabilization treatments. Analysis of high and moderate burn severities of the trail corridors and adjacent areas, a total of 6 miles are at unacceptable postfire risk to loss or damage.

Protection and Safety		cost	units	total
road warning signs	each	$750	8	$6,000
Trail warning signs/installation	each	$1350	6	$8,100
Temporary gates (materials and labor)	each	$3,000	1	$3,000
Trailhead hazard tree falling/per day	each	$605	4 days	$2,420
Culvert Removal Petijohn Creek 100 RD (deep fill culvert, 40 feet of fill is why cost is so high)	each	$27,686	1	$27,686
Storm patrol (10 days @400/day)	each	$400	10	$4,000
Subtotal Protection and Safety				$51,206

Drainage work needs to be completed within one year. About 6.5 miles of trail burned with high and moderate severity as is given priority based on burn severity areas, potential for capturing or intercepting increased post-fire flood runoff, main access trails to forest backcountry, near fish populations and locations adjacent to stream channels and crossings.

It is highly likely that the culvert at Pettijohn Creek on the 100 road is going to fail in the Spring as it is currently undersized and blocked with sediment and is ponding water behind it post fire. This culvert has about 40-50 feet of fill on top of it and will move a lot of material if this culvert fails. This culvert will require extra equipment and labor time to remove heavy fill and shaping of the road prism to prevent running surface unraveling during high water. It is recommended for removal with BAER funds, allow the first-year post fire run-off to occur, then

replace it with retained receipts from the Colville National Forest as this location was NEPA analyzed for upsizing.

Walker Creek Trails	3 - Highly Developed
Soil Burn Severity	**Miles**
High	0.6
Moderate	5.9
Low	6.1
Unburned	0.2
Grand Total	**12.7**

Recreational Facilities (dispersed campgrounds)

- There is an increased risk from flooding and debris flows for backcountry camps that are located near streams or in flood plain areas and located below burned areas. Hazard trees pose an increased risk to those who may camp or travel through the burned areas and need further assessment.

Protection/Safety Treatments:
Access to most trails and backcountry campsites affected by the fires is not suggested at this time due to hazard tree and other dangers. Warning signs are needed at five trailheads in the fire perimeter. Notifications should be sent to outfitter guide special use permit holders of the conditions of burned area. Road gate installation is suggested to help facilitate seasonal road closures due to elevated risk of flooding and debris flows in the Spring. Please see the treatment map for gate locations.

In the future when trail stabilization work takes place, it may still be necessary to keep some trails closed. Each trail will need to be further evaluated and signs posted on those trails that will remain closed until funds can be secured to reconstruct the trails. Hazard tree felling for each trailhead locations will be needed to ensure public and employee safety. Administration of closure orders will be needed to help ensure public safety. Storm patrol is requested to help the District Staff assess post storm conditions in the fire area and impact on BAER Critical Values.

Cultural and Heritage Resources:

A historic mining site is located in moderate to high burn severity areas and are fully exposed on an open Forest Service Road and have a high likelyhood of being looted. Putting a gate at the 3240-130 road and a closure in place for one growing season is recommended.

Item	Unit	Unit Cost	# Units	Total
Road Gate	each	$3,000	1	$3,000
	Total Land Treatment Cost			**$3,000**

I. Monitoring Narrative:

The effectiveness of the protection and safety treatments is highly dependent on monitoring and adaptive management. Monitoring will be done as time and funding is allows. The Forest may pursue the development of Forest-wide BAER monitoring plan.

Appendix A: Maps


WalkerCreek_BAER_Soil_Burn_Severity_Ma


WalkerCreek_BAER_ErosionHazardcompres


WalkerCreek_BAER_Treatment_Mapcompre

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										
EDRR BAER	acres	120	62	$7,440	$0		$0		$0	$7,440
EDRR Suppression	acres	120	16	$1,920	$0		$0		$0	$1,920
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$9,360	$0		$0		$0	$9,360
B. Channel Treatments										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
Trail stabilization	miles	2,580	6	$15,480	$0		$0		$0	$15,480
Storm Patrol	days	400	10	$4,000						
Culvert Removal	each	27,686	1	$27,686	$0		$0		$0	$27,686
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$47,166	$0		$0		$0	$43,166
D. Protection/Safety							$0		$0	$0
Road warning signs	each	750	8	$6,000						
Trail warning signs	each	1,350	6	$8,100						
Trailhead Haz Trees	days	605	4	$2,420						
Road Gate	each	3,000	2	$6,000						
					$0		$0		$0	$0
Insert new items above this line!							$0		$0	$0
Subtotal Protection/Safety				$22,520	$0		$0		$0	$0
E. BAER Evaluation										
				---	$0		$0		$0	$0
Initial Assessment	Report	$55,000	1	$55,000	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$55,000	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$79,046	$0		**$0**		**$0**	**$134,046**
Previously approved										
Total for this request				**$79,046**						

PART VII - APPROVALS

1. Rodney D. Smoldon Digitally signed by Rodney D. Smoldon Date: 2021.09.27 12:35:54 -07'00'

Forest Supervisor Date