
Date of Report: 8/31/2023**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 #_____
☐ Updating the initial funding request based on more accurate site data or design analysis

PART II - BURNED-AREA DESCRIPTION**A. Fire Name:** Elkhorn**B. Fire Number:** ID-PAF-002673**C. State:** Idaho**D. County:** Idaho**E. Region:** Region 1**F. Forest:** Nez Perce - Clearwater**G. District:** Red River Ranger District**H. Fire Incident Job Code:** P4QE58**I. Date Fire Started:** 7/24/23**J. Date Fire Contained:** not contained at date of assessment**K. Suppression Cost:** As of 8/26/2023, \$11.7mil**L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

- Fireline repaired (miles):** As of time of assessment, 6 miles machine line, 3 miles hand line are in progress of repair.
- Other (identify):** The Elkhorn Suppression Repair Plan includes 23 miles of road repair, incident command, base camp, staging area and drop point repair activities, removal of flagging and trash, and scattering slash. Reference the suppression repair plan for more information

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

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170602070702	Big Mallard Creek	36,517	308	1
170602070504	Dillinger Creek - Salmon River	26,511	7,123	27
170602070603	Lower Bargamin Creek	24,233	2,605	11
170602070701	Richardson Creek -Salmon River	23,737	12,929	54
170602070703	Trout Creek – Salmon River	26,213	3,233	12

N. Total Acres Burned (Nez Perce – Clearwater):*Table 2: Total Acres Burned by Ownership within Nez Perce – Clearwater Administrative Boundary*

OWNERSHIP	ACRES
NFS – NPC	11,796
NFS – PAF	14,293
STATE	--
PRIVATE	107
TOTAL	26,196

O. Vegetation Types: River breaks grasslands with scattered brush and trees on the lower elevation slopes. On north slopes, in the bottom of drainages, and on the upper elevations of the breaks, conifer forests dominate.

P. Dominant Soils: Soils within the elkhorn fire are characterized by steep, dissected mountain slopes with weakly developed inceptisols. Soil textures are typically shallow and skeletal coarse sandy loams derived from granitic bedrock.

Q. Geologic Types: Geology is dominantly granitics from the Idaho Batholith and Challis Magmatic complex, with some areas of Belt Metamorphics from the Elk City metamorphic sequence. The river bottom also consists of Quaternary alluvial deposits.

R. Miles of Stream Channels by Order or Class (Nez Perce – Clearwater):*Table 3: Miles of Stream Channels by Order or Class*

STREAM TYPE	MILES OF STREAM
PERENNIAL	35
INTERMITTENT	6.1
EPHEMERAL	--
OTHER	--

S. Transportation System (Nez Perce – Clearwater):

Trails: *National Forest (miles):* 21 *Other (miles):*

Roads: *National Forest (miles):* 0 *Other (miles):*

PART III - WATERSHED CONDITION**A. Burn Severity (acres; map in Appendix A):***Table 4: Burn Severity Acres by Ownership*

Soil Burn Severity	NPC NFS	PAF NFS	Private	Total	% within Full Fire Perimeter	% within Fire Perimeter on NPC
Unburned	1,911	2,088	17	4,016	15	16
Low	4,525	3,026	57	7,608	29	38
Moderate	4,194	5,634	32	9,861	38	36
High	1,166	3,544	0.75	4,711	18	10
Total	11,796	14,293	107	26196	100	100

B. Water-Repellent Soil (acres):

An estimated 1166 acres (10%) of NPC land within the Elkhorn Fire will show an increase in hydrophobicity post-fire. Hydrophobic soil conditions are expected to be temporary, breaking down in one to two years with freeze-thaw cycles and vegetation recovery.

C. Soil Erosion Hazard Rating:

Table 5: Pre-Fire Soil Erosion Hazard Rating by Area (NPC Land)

Hazard Rating	Acres	% area
Low	42	0.4
Mod	9853	83.5
High	1901	16.1

D. Erosion Potential:

ERMiT estimates for soil loss are 1.16 tons per acre following precipitation events on NPC land. As of 8/24/23, erosion and sediment transport has already been observed in nearly all drainages affected by fire that were visited by the BAER assessment team. Erosion was observed starting at the head of drainages and continuing to the river in areas not intersected by trails or live vegetation. Erosion was observed to be more severe on the PAF side of the river. This is likely due to consistently higher soil erosion hazard ratings and a higher portion of high SBS across the fire area, whereas NPC land did not have burned soils at the head of drainages and lower overall erosion ratings and SBS. Within NPC managed land the erosion hazard does increase to moderate-high where shrubs and trees burned with high severity. The lower slopes flanked with grasses generally have lower erosion potential on convex ridgelines outside of the drainages. That said the very steep slopes set up higher probability for sheet erosion on these barren slopes before they revegetate and stabilize over the next few years.

E. Sediment Potential:

Sediment potential in the Elkhorn fire is estimated to equal erosion potential due to steep, confined drainages. This is already evident in two drainages on PAF land having already deposited large amounts of sediment into the river post-fire, changing river flow in those locations.

F. Estimated Vegetative Recovery Period (years):

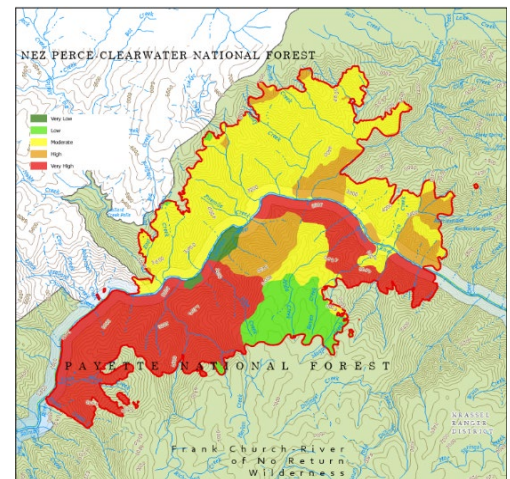
Vegetative Recovery is expected to occur within 1-3 years in low and moderate SBS conditions. High SBS and excess erosion can cause revegetation to take longer, but only accounts for 10% of NPC land within the Elkhorn fire perimeter.

G. Estimated Hydrologic Response (brief description):

The potential watershed responses of the Elkhorn Fire are: 1) an initial flush of sediment and ash, 2) rill and gully erosion in drainages and on moderate and steep slopes within the burned area, 3) increased discharge and peak flows, and 4) sediment deposition and transport in streams within and downstream of the fire. These responses are expected to be mild overall and greatest during initial storm events; they will attenuate over time (3-5 years) as vegetation and other ground cover becomes reestablished and soil hydrophobicity decreases.

Between July 30, the large burn day, and the time of the assessment, the Elkhorn Fire area received two large storm events. On August 6 and 7, 2023, strong slow-moving thunderstorms moved over the burned area. Precipitation gauges around the area measured 0.6-1.3" of rain from those storms. Small debris flows were observed in the Elkhorn Fire area. Then, on August 20-22, the Elkhorn Fire area received low-intensity, long-duration and then high-intensity, short-duration precipitation events from the after-effects of Hurricane/Tropical Storm Hillary moisture moving into the area. Precipitation gauges recorded over 1" of rain in the area in those 3 days. On the evening of August 22, a high-intensity storm moved across the area after the soaking rains of the prior two days and initiated debris flows of varying sizes from many of the drainages on both sides of the Salmon River. Visual observations indicated that many of the flows started at the tops of the drainages in the high and moderate soil burn severity areas. The largest debris flow was from Sapp Creek on the Payette

Figure 1: Pre-Fire Soil Erosion Hazard



National Forest. It created a deep incision in the entire drainage, pushing a large amount of debris into the Salmon River, creating a large rapid, a sediment deposit pinching the river, and woody debris (Figure 2). Effects of this storm were visible in nearly every drainage, large and small, along the storm path.



Figure 2. Photos of Sapp Creek debris flow on Elkhorn Fire from storms on August 20-22, 2023. a) Mouth of Sapp Creek debris flow; can observe the width of disturbance at the mouth where debris came across the land. b) Sediment deposition immediately downstream of Sapp Creek, creating constriction on the Salmon River. c) Looking downstream at the mouth of Sapp Creek. Sediment deposition on the left creating constriction and new rapid on the Salmon River. d) Looking across at Sapp Creek watershed. Debris flow channels starting very high on the slopes and scouring to bedrock along most of the flow path to the Salmon River at the bottom of the photo. All photos taken by Erin Grinde.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Elkhorn Fire began on July 24th near Little Trout Creek on the Payette National Forest. On July 30, 2023, weather aligned to push the fire across the Salmon River onto Nez Perce – Clearwater National Forest System (NFS) Lands and private lands along the river corridor. The remote location, steep terrain, and limited access created a difficult initial attack situation. Between past fire scars and three large August precipitation events, the fire spread was minimal after the large run on July 30. As of August 29, the fire objectives were 88% complete.

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

Table 6: 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):

Value	Probability	Consequence	Rating	Threat
Recreationalists, Residents & Forest Employees (Salmon River corridor)	Possible	Major	High	Threats to people from flooding/flash flooding and debris flows, hazard trees, and rockfall along trails, and dispersed recreational areas along the Salmon River and within the fire area.

2. Property (P):

Value	Probability	Consequence	Rating	Threat
NFS Trail 096	Very Likely	Major	Very High	Threats to the trail from flooding and debris flow. The trail is along the bottom of the slope, transecting all the drainages, with moderate and high burn severity above.
NFS Trail 502	Possible	Major	High	Threats to the trail from flooding and debris flow.
NFS Trail 577	Likely	Major	Very High	Threats to the trail from flooding and debris flow.
Bargamin Creek Trail Bridge	Possible	Major	High	Threats of bridge failure from burned wing walls and possible embankment failure.

3. Natural Resources (NR):

Value	Probability	Consequence	Rating	Threat
Native and Natural Plant Communities	Likely	Moderate	High	Threat to native vegetation from competition from noxious weeds.
Bull Trout, Steelhead, Snake River Fall Chinook, Spring Chinook and Sockeye Salmon	Unlikely	Minor	Very Low	Loss or degradation of designated critical habitat and/or loss of individuals from increased sedimentation.
Whitebark Pine	Possible	Minor	Low	Threats to degradation of habitat and/or loss of individuals from burn.
Hydrologic Function	Very Likely	Minor	Low	Scour and other changes in channel morphology and bed composition. Threats to other resources.
Soil Productivity	Likely	Minor	Low	Accelerated erosion and increased sediment delivery. Threats to other resources from erosional processes.

4. Cultural and Heritage Resources:

Value	Probability	Consequence	Rating	Threat
Site 183	Unlikely	Minor	Very Low	Threat to site integrity based on erosion and sedimentation.
Site 1529	Very Likely	Moderate	Very High	Threat to site integrity based on erosion and sedimentation.
Site 3198	Possible	Minor	Low	Threat to site integrity based on erosion and sedimentation.

B. Emergency Treatment Objectives:

- a. Reduce unacceptable risks to human life and safety from flooding, debris flows, and other threats such as hazard trees. Taking immediate actions to protect human life is the single overriding objective prior to implementing other actions.
- b. Reduce unacceptable risks to roads, trails, and bridge infrastructure due to imminent erosion and flooding post fire events. Prevention of additional loss to infrastructure and a reduction of threats to threatened and endangered species habitat are objectives for the proposed treatments.
- c. Reduce unacceptable risks to native and naturalized vegetation communities from the threat of noxious weeds and invasive species.
- d. Reduce unacceptable risks to cultural and heritage resources due to imminent erosion and flooding post-fire events. Prevention of additional loss to cultural and heritage resources from erosion or sedimentation or looting are objectives for the proposed treatments.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:**Land:** Likely**Channel:** NA**Roads/Trails:** Possible**Protection/Safety:** Likely**D. Probability of Treatment Success***Table 5: Probability of Treatment Success*

	1 year after treatment	3 years after treatment	5 years after treatment
Land	90	85	85
Channel	NA	NA	NA
Roads/Trails	85	90	90
Protection/Safety	95	100	100

E. Cost of No-Action (Including Loss): \$538,000**F. Cost of Selected Alternative (Including Loss): \$168,750****G. Skills Represented on Burned-Area Survey Team:**

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

Team Leader: Erin Grinde**Email:** erin.grinde@usda.gov**Phone(s):** 208-494-4063**Forest BAER Coordinator:** Erin Grinde**Email:** erin.grinde@usda.gov**Phone(s):** 208-494-4063

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

Skill	Team Member Name
<i>Team Lead(s)</i>	Erin Grinde
<i>Soils</i>	Austin Wrem (t)
<i>Hydrology</i>	Erin Grinde
<i>Engineering</i>	Zoltan Kiss (lead), Kalven Metz (t), William Griffith (t)
<i>GIS</i>	
<i>Archaeology</i>	Kaitlyn Eldredge
<i>Weeds</i>	Alyssa Badertscher
<i>Recreation</i>	Noel Payne (t), Doug Olive, Sean Santolin
<i>Other</i>	

H. Treatment Narrative:**Land Treatments:**

P1a & P1b EDRR: Reduce the potential occurrence of new noxious weed infestations in native or naturalized communities, particularly where weeds may spread into highly susceptible burned areas, while also decreasing rate of spread of weed density from existing infestations in these sensitive areas.

Invasive plants and weed assessments will be conducted in FY2024 for Early Detection and Rapid Response (EDRR) on any new infestation located within our high risk areas. Treatments will occur at proper phenology of each species to ensure maximum control. This treatment will be supplemented by natural re-vegetation.

Assess areas that have a high potential for weed/invasive species establishment. Additional critical areas include roads, hand lines, and burned areas where suppression vehicles and equipment traveled through known noxious weed/non-native invasive plant species populations. Disturbed areas within and along the fire perimeter, such as hand lines, staging areas and ICP will also be prioritized for monitoring and treatment.

Assessment and control will also occur along trail-adjacent burned areas, though a smaller footprint overall. The trail is heavily used by river users as well as overland recreationalists. Weed treatment along the route is a critical need to ensure the native plant communities can recover and minimize the invasion of new species. Due to the remote nature of this area, the cost for treatment is the same as the roadside treatment. The treatment will require jet boat support as access is very limited in the Wild and Scenic River corridor of the Salmon River.

*BAER EDRR – 170 acres (23 miles of road)
49 acres (10 miles of trail)*

Design/Construction Specifications:

1. Conduct short-term monitoring in FY2024 using early detection and rapid response (EDRR) assessment/monitoring of noxious weed/non-native invasive plant species infestations within the burned area. Monitoring the post-fire presence or spread of invasive species throughout the fire area.
2. Inventory/assessment and mapping new noxious weed infestations within burned area using GPS technology (Field Maps) and upload into the TESP-IS national database for Red River Ranger District.
3. Chemical treatments using pickups, UTVs and backpack spray units will be used on any noxious weeds located within the fire perimeter on NP-C Forest lands. Coordination with Idaho County or other contractors will be conducted to treat noxious weeds found on main access roads to the burn perimeter.

EDRR Treatment Cost Estimate

Item	UOM	Unit cost	# of units	Total Cost
Suppression EDRR	Acre	\$300	170	\$51,000
BAER EDRR	Acre	\$400	49	\$19,600
Total				\$70,600

Channel Treatments: None recommended

Roads and Trail Treatments:

T1. Trail Drainage Stabilization: The steep slopes within the Elkhorn Fire combined with the lack of vegetation in the moderate and high burn severity portions of the fire will lead to erosion from increased runoff and potential debris flows from precipitation events. Rocks and woody debris will also roll or fall onto the trail, creating erosional knick points. Drainage

NFST #	NAME	Miles
96	Salmon River Trail	10.2
502	Bargamin Trail	2
577	Rattlesnake Trail	1.9

Trail Drainage Stabilization Cost Estimate:

Item	UOM	Unit cost	# of units	Total Cost
Trail Drainage Stabilization	miles	\$5,500	14 miles	\$77,550

Protection/Safety Treatments:

S1b. Trail/Recreation Hazard Signs: The overall purpose of this treatment is to reduce risks to human life and safety by Forest visitors of existing threats while traveling within and downstream of the burned area.

“Entering Burned Area” signs are needed to alert the public of possible threats to their life and safety that exist within or downstream of a burned area. The signs contain language specifying items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, and flash floods.

Warning Signs Cost Estimate.

Item	UOM	Unit cost	# of units	Total Cost
Trail/Recreation Hazard Signs	Number of signs	\$24	4	\$96

H1 Heritage and Cultural Resource Protection

A one-time monitoring of sites will be conducted. The patrol will document changes to the site in terms of artifact and feature composition that indicate if archeological looting and /or erosion/sedimentation is occurring that could affect site integrity. The results of the patrols will be used to determine if additional management action is required to protect these sites.

Cultural Resource Protection Patrols Cost Estimate

Item	UOM	Unit cost	# of units	Total Cost
Cultural Resource Protection Patrols	Event	\$3,600	1	\$3,600

I. Monitoring Narrative: No monitoring proposed

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Line Items	Units	Unit Cost	# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	Total \$
A. Land Treatments										
Noxious Weeds Treatments Non-Suppression Roads	acres	300	170	\$51,000	\$0		\$0		\$0	\$51,000
Noxious Weeds Treatments Non-Suppression Trails	acres	400	49	\$19,600	\$0		\$0		\$0	\$19,600
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				<i>\$70,600</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$70,600</i>
B. Channel Treatments										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				<i>\$0</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$0</i>
C. Road and Trails										
Trail Drainage Stabilization	mile	5,500	14	\$77,550	\$0		\$0		\$0	\$77,550
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road and Trails</i>				<i>\$77,550</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$77,550</i>
D. Protection/Safety										
Trail/Recreation Hazard Sign	each	24	4	\$96	\$0		\$0		\$0	\$96
Heritage Patrols	each	3,600	1	\$3,600	\$0		\$0		\$0	\$3,600
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				<i>\$3,696</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$3,696</i>
E. BAER Evaluation										
Initial Assessment	Report	\$85,000	1	---	\$85,000		\$0		\$0	\$85,000
				\$0	\$0		\$0		\$0	\$0
				---	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				<i>\$0</i>	<i>\$85,000</i>		<i>\$0</i>		<i>\$0</i>	<i>\$85,000</i>
F. Monitoring										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				<i>\$0</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$0</i>
G. Totals										
Previously approved				\$151,846	\$85,000		\$0		\$0	\$236,846
Total for this request				\$151,846						

PART VII - APPROVALS

1. _____
 Forest Supervisor Date

Appendix A: Soil Burn Severity and Treatment Recommendation for Elkhorn Fire on Nez Perce – Clearwater NFs

