Date of Report: November 21, 2022

BURNED-AREA REPORT

NORTON FIRE 2022
SALMON-CHALLIS NATIONAL FOREST

Norton Fire, September 8, 2022 (Photo from inciweb).

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: Norton Fire

B. Fire Number: ID-SCF-022139

C. State: Idaho

D. County: Valley

E. Region: 4 (Intermountain)

F. Forest: Salmon-Challis NF

G. District: Middle Fork

H. Fire Incident Job Code:

I. Date Fire Started: August 1, 2022

J. Date Fire Contained: *est* November 5, 2022

K. Suppression Cost: $920,000

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

1. **Fireline repaired (miles):** No fireline constructed
2. **Other (identify):** N/A

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170602050906	Cougar Creek-Middle Fork Salmon River	26054	575	2%
170602050804	Lower Marble Creek	21939	5131	23%
170602060401	Norton Creek	12597	6239	50%
170602060403	Sheep Creek	16858	130	1%
170602050803	Trail Creek	16841	243	1%

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	12,317
OTHER FEDERAL	0
STATE	0
PRIVATE	0
TOTAL	12,317

Note: The total acreage reported in this BAER report differs from the acreage reported on inciweb.com (9069 acres) because it includes some unburned areas within the fire perimeter that are not included in the mapping shown on inciweb.

O. Vegetation Types: Approximately 87% of the burned area consists of forested cover types, with the dominant tree species being Douglas Fir. Sparse forests exist on south aspects, while thicker forest cover exists on northern aspects. Approximately 13% of the burned area consists of open slopes consisting of bunchgrass, fescue, grass, forb, and barren cover types.

Cover Types	Acres	Percent
Douglas-fir	7192	58.4%
Lodgepole Pine	2440	19.8%
Bunchgrass/Fescue	1086	8.8%
Ponderosa Pine	626	5.1%
Dry Shrub/Bunchgrass	169	1.4%
Grass/Forb	169	1.4%
Fescue/Conifer	167	1.4%
Fescue	158	1.3%
Spruce/Fir	152	1.2%
Aspen	94	0.8%
Barren	27	0.2%
Bunchgrass	13	0.1%
OTHER COVER TYPES	23	0.2%
TOTAL	**12,317**	

P. Dominant Soils: Soils in the burned area are described based on Landtypes shown in the table below.

Landtype Description	Landtype	Acres	Percent
Moderately dissected mountain slope land- moderately deep and shallow loamy skeletal soils	120b-9	4803	39.0%
Moderately dissected cryoplanated mountain slopes- deep skeletal sandy and loamy soils	109b-1	3414	27.7%
Strongly dissected mountain slope land- moderately deep loamy skeletal soils	120c-4	1114	9.0%
Weakly dissected mountain slope land- moderately deep and deep loamy skeletal soils	120a-2	835	6.8%

Moderately dissected mountain slope land- moderately deep and deep loamy skeletal soils	120b-10	655	5.3%
Cryoplanated upland- deep skeletal sandy and loamy soils	109-8	466	3.8%
Cryoplanated upland- shallow skeletal sandy and loamy soils	109a	329	2.7%
Steep canyon lands- shallow and moderately deep sandy soils	124	326	2.6%
Benchy mountain slope land- deep fine loamy soils	125-1	155	1.3%
Rocky ridge land	113	118	1.0%
OTHER LANDTYPES		101	0.8%
TOTAL		**12,317**	

Q. Geologic Types: Geologic types in the burned area are defined by Landtype Geology.

Volcanic Landtypes	12,071 acres	98%
Granitic Landtypes	246 acres	2%

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	25.7
INTERMITTENT/EPHEMERAL	20.1

S. Transportation System:

Trails: *National Forest (miles):* 11.5 miles (non-motorized) *Other (miles):* N/A
Roads: *National Forest (miles):* 0 miles *Other (miles):* N/A

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

BARC Model: The BAER Team used BARC (Burned Area Reflectance Classification) data derived from the Forest Service Remote Sensing Applications Center (RSAC) as a basis for analyzing burn intensity (vegetative scorch) and burn severity (fire impacts to the soil). BARC data were derived from a comparison of Landsat 9 OLI-2 satellite imagery on 9/19/2022 with pre-fire Landsat 8 OLI satellite imagery from 9/24/2021. The original classification thresholds of the BARC model are as follows:

Original BARC thresholds: Unburned/Undetectable 0-65, Low 66-121, Moderate 122-195, High 196+

Field sampling of burn severity (soil burn severity testing) was not conducted on the Norton Fire because of extreme difficulty in accessing the burned area and the lack of values at risk that would necessitate emergency treatments. Analysis of fire behavior and photographs suggests that the majority of the fire burned at low intensity, with slow growth occurring throughout the duration of most of the fire and a few areas of moderate and high intensity burn corresponding to wind-driven runs. This information suggests that burn intensity as shown on the BARC is fairly accurate. However, it is unknown how burn intensity as shown in the BARC data relates to burn severity impacts to the soil. For this assessment, we assume that burn severity is roughly equivalent to burn intensity, based on similar findings in other wildfires in the area.

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	Other Federal	State	Private	Total	% within the Fire Perimeter
Unburned	3,169	0	0	0	3,169	25.7%
Low	5,380	0	0	0	5,380	43.7%
Moderate	3,151	0	0	0	3,151	25.6%
High	616	0	0	0	616	5.0%
Total	**12,317**	**0**	**0**	**0**	**12,317**	

B. Water-Repellent Soil (acres): Approximately 700 acres. Water repellent soils are likely present in areas of high burn severity in certain cover types, as well as some areas of moderate burn severity where heavy ground fuels caused extended periods of smoldering.

C. Soil Erosion Hazard Rating: Landtype Association Erosion Hazard Ratings for the burned area are shown in the table below:

LTA Erosion Hazard Rating	Acres	Percent
Low	0	0%
Moderate	0	0%
High	12,317	100%
Very High	0	0%
TOTAL	**12,317**	

D. Erosion Potential: N/A

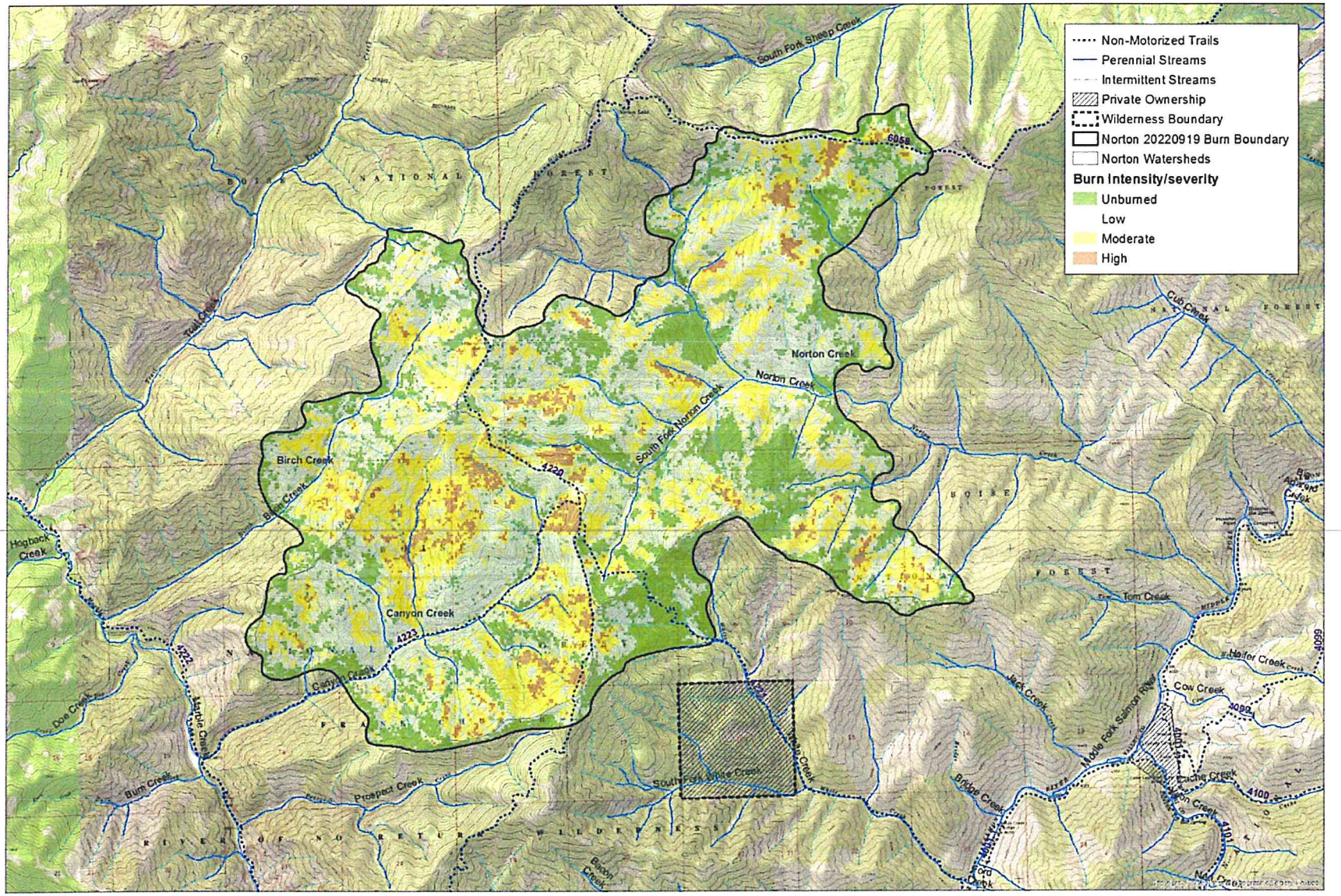
E. Sediment Potential: N/A

F. Estimated Vegetative Recovery Period (years): 1-3 (grasses), 2-5 (woody), 10-50 (conifers)

G. Estimated Hydrologic Response (brief description):

Approximately 70% of the burned area consists of unburned/undetectable or low severity burn. Minimal changes in terms of hydrologic processes are expected in these areas. Areas where the fire did burn at moderate and high severity are somewhat concentrated within the Canyon Creek drainage, and elsewhere scattered in isolated locations in portions of the Norton Creek drainage. The potential for post-fire debris flow events in the Canyon creek drainage is moderate if a short duration, high intensity rainstorm were to occur over this area, as a result of high and moderate burn severity on some of the upper slopes and the steep (>45%) slopes that are present throughout almost the entire burned area. Potential debris flow events are likely to be localized, and any influxes in sediment and/or streamflow would likely be attenuated in Marble Creek, resulting in low risk of downstream effects to values along the Middle Fork Salmon River.

Watershed	Outside of burned area (acres/%)	Unburned (acres/%)	Low severity (acres/%)	Moderate Severity (acres/%)	High Severity (acres/%)
Birch Creek (2443 acres)	1048	323	644	394	35
	43%	13%	26%	16%	1%
Canyon Creek (4251 acres)	618	505	1640	1183	305
	15%	12%	39%	28%	7%
Norton Creek (12,595 acres)	6357	1713	2763	1498	265
	50%	14%	22%	12%	2%



Burn Intensity/Severity Map for the Norton Fire, Salmon-Challis National Forest

Map created 10/13/2022 by the Salmon-Challis National Forest Woodtick Fire BAER Team. BARC Data and Fire Perimeter from analysis of Landsat 9 satellite data, by USDA Forest Service, Geospatial Technology and Applications Center, BAER Imagery Support Program. BARC imagery date: 9/19/2022. This map shows burn intensity (vegetative scorch) derived from BARC data, Burn intensity not field verified. Burn severity was assumed to be roughly equivalent to burn intensity. Burn Boundary Acreages: 12,317 acres. Some additional fire growth has likely occurred since 9/19/2022.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Norton Fire started on August 1, 2022 as a result of lightning. The fire burned for the remainder of the summer, primarily smoldering at low intensity, but at times making small wind-driven runs. The entire burned area is within the Frank Church River of No Return Wilderness. A point protection stragegy was used on this fire because of difficult access, steep terrain, fire behavior, and firefighter safety concerns. Despite extremely dry fuels and low humidites, fire behavior was typical of lightning-caused fires in the Frank Church River of No Return Wilderness, resulting in a mosaic burn across varied fuel types largely dependent on aspect.

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):

BAER Value: Human life and safety on or in close proximity to burned NFS lands
What is at Risk: Human life and safety
Probability: Possible
Consequences: Major
Risk: High
Comments: Increased hillslope erosion, rockfall, and hazard trees are likely throughout the burned area. Most of the burned area is in remote Wilderness, with Wilderness trails being the only developed access into the area. Backcountry users will be exposed to various post-fire hazards in the short term (1 to 3 years) including rockfall, root holes, and flood/debris flow hazards during storm events. These hazards will diminish after the first few years, but deadfall will likely be a persistent hazard in this area as a result of the fire for the next 10+ years. Risks along the Middle Fork Salmon River as a result of the fire are low, although increased streamflows during storm events could potentially occur in Marble Creek and Norton Creek.

2. Property (P):

BAER Value: Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands
What is at Risk: Wilderness Trails
Probability: Possible
Consequences: Moderate
Risk: Intermediate
Comments: Portions of the Canyon Creek (#4223), Norton Lake (#4220), and Bear Creek Point (#6058) Trails cross through or adjacent to areas of high or moderate severity burn within the burned area of the Norton Fire. Post-fire risks to trails include erosion and potential loss of trail as a result of post-fire runoff, soil erosion, and/or debris flows. The highest risk to trails occurs where trails are situated within any high severity burned area, or within or below steep slopes burned at moderate severity. High risk may also occur to trails that are located adjacent to streams in drainages that burned at moderate and high severity. The total length of trail that is directly at risk as a result of this fire is relatively small, with the Norton Lake and Bear Creek Point Trails located on ridgetops above the burned slopes. The Canyon Creek Trail may be at some risk because of its proximity to Canyon Creek, which may experience high flows, increased sediment loads, and potential debris flows that could indirectly affect the trail.

3. Natural Resources (NR):

BAER Value: Soil productivity and hydrologic function on burned NFS lands
What is at Risk: Soil erosion and stream channel function
Probability: Likely
Consequences: Minor
Risk: Low
Comments: Increased soil erosion will likely occur, particularly in areas of high burn severity and steep slopes. Ground cover will likely recover quickly (1-3 years) in low and moderate severity burned area, and over a period of 3 to 5 years in high severity burned areas, and longer on steep slopes burned at high severity. Post-fire flooding and/or debris flows are possible, with the potential to deposit large amounts of mud, gravel, rocks, and trees into larger drainages such as Marble Creek. These potential impacts would likely have little effect on the Middle Fork Salmon River, other than increased turbidity and sediment loads. Because debris flows are part of the natural balance in this system and have created many of the morphologic features in this area, this will not alter the overall balance of this high fire frequency system in terms of hydrologic function.

BAER Value: Critical habitat or suitable occupied habitat for federally listed threatened or endangered terrestrial, aquatic animal or plant species on or in close proximity to buned NFS lands
What is at Risk: Chinook, Steelhead, and Bull Trout Habitat
Probability: Likely
Consequences: Minor
Risk: Low
Comments: Fish presence is limited within the burned area of the Norton Fire, although steelhead are present in Norton Creek. Portions of Norton Creek are designated critical habitat for bull trout, and portions of Canyon Creek are designated critical habitat for steelhead. Marble Creek, Trail Creek and the Middle Fork Salmon River provide presence and designated critical habitat for bull trout, steelhead, and Chinook salmon. The fire appeared to mimic natural fire patterns that would have historically occurred in this area and are critical to developing and maintaining quality fish habitat and fish populations by introducing woody debris and spawning gravel to the river system through increased erosion and debris flow events. Although debris flows may impact localized fish populations in the short term, the fire did not generate any large-scale risks to critical fish values.

BAER Value: Native or naturalized communities on NFS lands where invasive species or noxious weeds are absent or present only in minor amounts
What is at Risk: Spread of invasive species
Probability: Possible
Consequences: Moderate to Major
Risk: Intermediate/High
Comments: The burned area is susceptible to colonization by invasive species. The species known to be present in the area have the potential to disrupt native plant community reestablishment in areas otherwise uninfested by noxious weeds. However, no emergency conditions exist at this time within the burned area.

4. Cultural and Heritage Resources:

BAER Value: Cultural resources on NFS lands which are listed on or potentially eligible for the National Register of Historic Places
What is at Risk: Historic Properties
Probability: Possible
Consequences: Moderate
Risk: Intermediate
Comments: Few cultural resources are located within and adjacent to the burned area. Some of these cultural resources are eligible for listing on the National Register of Historic Places (NRHP).

Impacts by fire-induced erosion or looting may damage or destroy the archaeological record and the depositional context important to the site's significance and information potential. However, the risk of damage to these values from erosion, increased runoff, and looting is unlikely.

B. Emergency Treatment Objectives:

- Reduce the risk of loss of Forest trail infrastructure.

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

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land	N/A	N/A	N/A
Channel	N/A	N/A	N/A
Roads/Trails	80%	70%	70%
Protection/Safety	N/A	N/A	N/A

E. Cost of No-Action (Including Loss): Estimated cost to replace 0.5 miles of Wilderness trails is $12,000.

F. Cost of Selected Alternative (Including Loss): The total cost of proposed treatments is $5,000. Implementing the proposed treatments would reduce the probability of experiencing loss by 0.50, and the expected benefit of treatment would be $6,000. Treatment is justified.

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader:
Email: david.deschaine@usda.gov **Phone(s):** (208)756-5171

Forest BAER Coordinator: David Deschaine
Email: david.deschaine@usda.gov **Phone(s):** (208)756-5171

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

Skill	**Team Member Name**
Team Lead(s)	Dave Deschaine
Soils	Deanna Stever
Hydrology	Bill MacFarlane
Engineering	N/A
GIS	Bill MacFarlane
Archaeology	Audrey Westmoreland
Weeds	Tommy Gionet
Recreation	Nick Schade
Fisheries	Christine Stewart

H. Treatment Narrative:

Land Treatments: No BAER treatments proposed at this time.

Channel Treatments: No BAER treatments proposed at this time.

Roads and Trail Treatments:

Wilderness Trail stabilization/storm-proofing

Based on an analysis of the burn severity within the Norton Fire burn area and slope data, the trails listed in the table below have been identified as being "at risk" from post-fire flooding, erosion, or debris flows, and the Forest will have the capacity to work on these trails early in the 2023 season if funded through BAER. The segments identified for project work are those within or downslope from areas burned at moderate and/or high severity, particularly on steep slopes, based on the burn severity mapping.

Drainage features will be constructed, and other stabilization measures taken on trails that have a high risk of loss or damage due to increased runoff expected within the first year following fire. Previous fires on the Salmon-Challis NF have shown that moderate and high burn severity areas have a high potential to impact existing trail systems. Treatments are proposed to reduce unacceptable risks within high severity burned areas and steep slopes burned at moderate and high severity.

Emergency trail stabilization project work identified within the Norton Fire burn area is for approximately 0.5 miles of trail on one trail segment. The Forest plans to utilize a partnership agreement with a youth conservation corps for 1 hitch. A youth conservation corps costs approximately $15,000 per hitch and a hitch consists of 8 days. The total cost requested from BAER funding for emergency Wilderness trail stabilization needed due to the Norton fire is $5,000. An additional $10,000 of non-BAER funding will be used to fund the remainder of the hitch, for additional non-emergency trail work in the burned area.

TRAIL #	TRAIL NAME	MILES	BAER funding requested	Non-BAER funding	Total
6058	Bear Creek Point	0.5	$5,000	$10,000	$15,000
	TOTAL	0.5	$5,000	$10,000	$15,000

The trail work will be implemented on trails lacking adequate drainage features for anticipated increased runoff by field crews using appropriate equipment and will include construction of wood and rock water bars, dip-drains, and rolling dips, as well as armoring of stream/drainage crossings. The work will follow Forest Service trail specifications, and the proposed trail work will be the minimum required to prevent serious erosion and/or loss of the trail infrastructure. Treatments will follow design specifications in the Burned Area Emergency Response Treatments Catalog (USDA Forest Service, 2006). The number of structures to be constructed will depend on burn severity, soil type, trail slope, and topography. Drainage structures will not be required along the entire length of each of these trail segments, however we expect the need for a significant number of drainage structures due to the steep slopes and fire severity.

All of the trail work will be completed by the end of August 2023, with the expectation that the trails would be stabilized prior to the high magnitude thunderstorms that typically occur in the late summer.

Protection/Safety Treatments: No BAER treatments proposed at this time.

I. Monitoring Narrative:

Proposed trail treatment areas will be monitored during routine visits by Wilderness patrol. No additional BAER funding is requested.

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										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$0	$0		$0		$0	$0
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	0.5	10,000	$5,000	$0		$0		$0	$5,000
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$5,000	$0		$0		$0	$5,000
D. Protection/Safety										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$0	$0		$0		$0	$0
E. BAER Evaluation										
Initial Assessment	Report		1	---	$400		$0		$0	$400
				$0	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$0	$400		$0		$0	$400
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				$5,000	$400		**$0**		**$0**	**$5,400**
Previously approved										
Total for this request				**$5,000**						

PART VII - APPROVALS

1. Charles A. Mark — 11/29/22

Forest Supervisor — Date