Date of Report: 10/11/2023

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: Morgan

B. Fire Number: OR-FWF-230307

C. State: OR

D. County: Lake

E. Region: R6

F. Forest: Fremont-Winema NF

G. District: Paisley

H. Fire Incident Job Code: 0602 P6QNS323

I. Date Fire Started: 9/18/2023

J. Date Fire Contained: 10/06/2023

K. Suppression Cost: $6,313,086 (as of 9/29/2023)

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

1. **Fireline repaired (miles): 23 Miles**
2. **Other (identify):**

M. Watershed Numbers:

Table 1: Acres Burned by Watershed all within the 12th field HUC

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
171200060106	South Creek	27698	2271	8%

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	1744
OTHER FEDERAL (LIST AGENCY AND ACRES)	0
STATE	0
PRIVATE	527
TOTAL	2271

O. Vegetation Types:
The primary vegetation type within the fire perimeter is a mixed confer forest including White Fire, Ponderosa Pine, Lodgepole pine, with an understory component of manzanita, ceanothus, and Oregon grape. There are pockets of quaking aspen stands, and some small dry and wet meadow areas with Carex and Sedge species. The perennial stream of Morgan creek runs through the northern portion of this fire and supports woody willow and riparian species.

Table 3. Plant Community Types and Abundance within the fire perimeter

Community Type	Percent of area	Description
Mixed fir	52%	White fir/ponderosa pine/Lodgepole pine/ quaking aspen/ various shrubs including ceanothus, manzanita, snowberry, serviceberry, and bitter cherry
Ponderosa pine	33%	Ponderosa pine with scattered juniper and white fir, bitterbrush, sagebrush along with native grasses
Juniper Step	9%	Juniper, Mt. mahogany, bitterbrush, big sagebrush along with native forbs and grasses
Non forested types	6%	Shrub and grass lands dominated by low sage, bitter brush, Idaho fescue and blue bunch wheatgrass, includes meadows and riparian vegetation

P. Dominant Soils: Soils are considered to have developed in-situ as residuum for most of the area. These soils are mainly fine loamy and loamy textures. Clay and sand content varies in profiles depending on profile development. Pumice and volcanic ash comprise parts of many upper profile horizons. Rock fragments dominate surface horizons (60% + rock fragments) on some convex and planar backslopes. Soil organic matter content or dark soil colors range from 3 to 10 cm in thickness under treed soils and greater up to 35 cm or more under shrub dominant soils. Soil depths range in thickness with shallow and skeletal soils being less resilient to compaction or displacement and deeper soil more resilient to soil compaction and displacement.

Q. Geologic Types:
Known regionally as the Early Winema volcanic field and locally as the Brattain District, the bedrock underlying the area is a thick complex of igneous formations comprised of alternating extruded layers of lava and air-lain pyroclastic flows. Faulting in this thick sequence of igneous layers is extensive. Uprising lava intruded from below through faults as domes, dikes, and sills into the thick igneous layers. Sedimentary rocks interfinger into the igneous layers or underlie them. Thin deposits of much younger volcanic ash and pumice blanketed the area. Surrounding are ancient lake sediments. More recently

colluvium, windborne volcanic ash, large landslide deposits, alluvial deposition, and erosion continue to shape the current terrain.

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	2.18
INTERMITTENT	5.13
EPHEMERAL	1.14
OTHER	0

S. Transportation System:

Trails: *National Forest (miles):* 0.4 *Other (miles):* 0

Roads: *National Forest Level 2 road (miles): 4.5 , closed temp road (miles): 3*

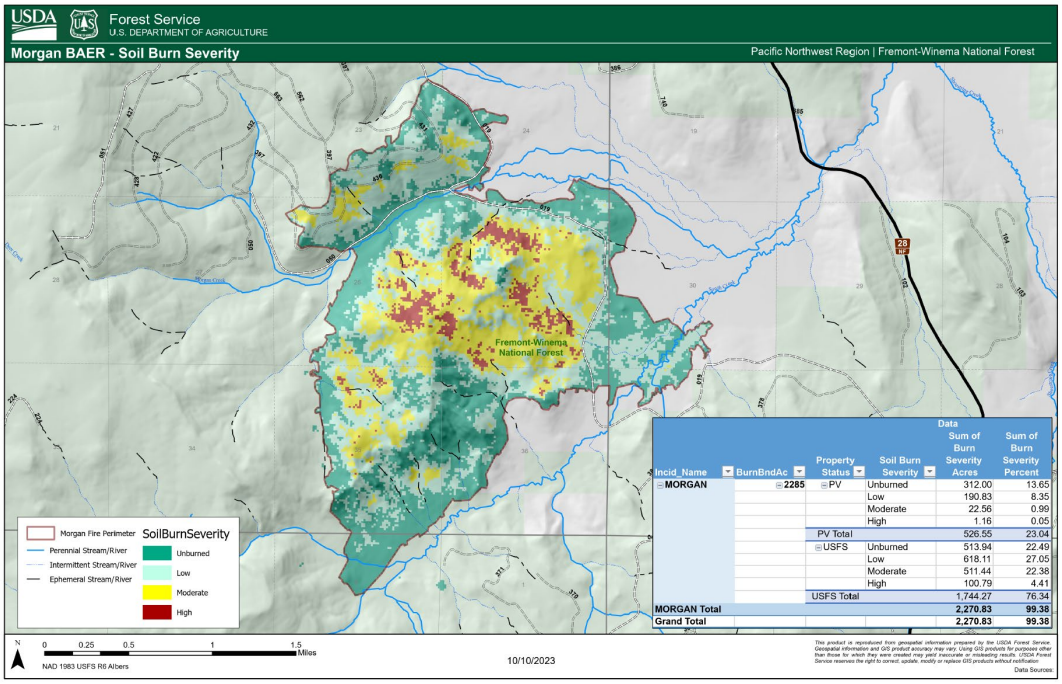
PART III - WATERSHED CONDITION

T. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	Private	Total	% within the Fire Perimeter
Unburned	514	312	826	36
Low	618	191	809	35
Moderate	511	23	534	24
High	101	1	102	5
Total	1744	527	2271	100

Figure 1. Soil Burn Severity Map



Incid_Name	BurnBndAc	Property Status	Soil Burn Severity	Sum of Burn Severity Acres	Sum of Burn Severity Percent
MORGAN	2285	PV	Unburned	312.00	13.65
			Low	190.83	8.35
			Moderate	22.56	0.99
			High	1.16	0.05
		PV Total		526.55	23.04
		USFS	Unburned	513.94	22.49
			Low	618.11	27.05
			Moderate	511.44	22.38
			High	100.79	4.41
		USFS Total		1,744.27	76.34
MORGAN Total				2,270.83	99.38
Grand Total				2,270.83	99.38

U. Water-Repellent Soil (acres):

An estimate of the percentage of each soil burn severity (SBS) rating is identified as hydrophobic (water repellent). Hydrophobic acres of each rating represent the landscape surface area affected by 1,000-hour fuels that were consumed. These areas resulted in orange colors soil, alteration of surface soil structure,

consuming of roots in the upper soil profile, and charging of soil particles in the immediate area all increasing soil water repellency. In general, the hydrophobicity ranges from slight to strong repellency in these areas. Most hydrophobic changes in the burn area are small scale and disconnected from other hydrophobic areas by moderate or low SBS.

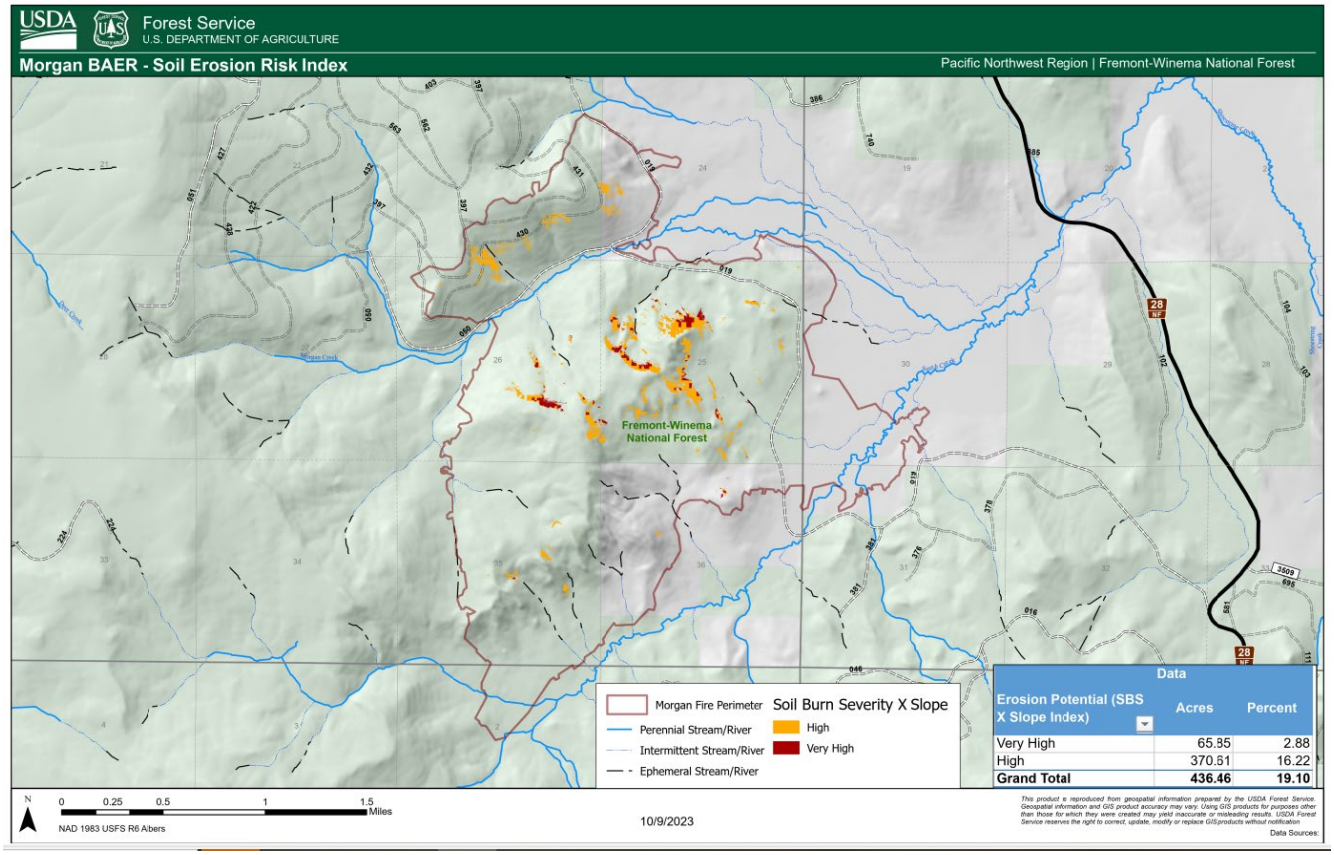
Table 6. Burn Severity Acres by Ownership

SBS	USFS Acres	Hydrophobic Acres
Unburned	514	0
Low	618	3
Moderate	511	15
High	101	3
Total	**1744**	**31**

V. Soil Erosion Hazard Rating:

A map is provided showing areas of increased risk for soil erosion. Slope breaks of 0 to 5 percent in all SBS ratings have little risk of soil erosion. Slope breaks 6 to 20 percent and greater than 20 percent on moderate and high SBS areas are presented in the map, “Erosion Risk Index, Soil Burn Severity X Slope”. Areas less than 5 percent slope, no matter the SBS rating, are considered like background soil erosion potential. The map below is included with the files of this analysis.

Figure 2. Soil Erosion Index Map



W. Erosion Potential:

High SBS areas have a high to very high potential for erosion to occur and are influenced by increased

slope, lack of surface rock fragments, and presence of large or fine wood. Soil structure and surface roots have been altered for the most part in high SBS areas but occurs as a mosaic among moderate and low SBS areas. Long uninterrupted mountain backslopes lacking surface roughness either by rock fragments or surface features have the greatest potential to connect high SBS areas by riling or sheet erosion. For ethe most part, long, steeply sloping areas are mostly low SBS with areas of moderate SBS in the fire perimeter. Moderate SBS areas have a lower erosion rating than high SBS because of needle cast, intact scorched duff layer, and/or canopy protection common in this fire that protects the soil from rain fall. Although the intact soil structure and roots in the soil surface of the moderate SBS areas are more resistant to erosion forces than high SBS soils, concentrated sheet flow from these areas can result in riling and sheet flow erosion of some degree when surface cover and rock fragments are less than 35 percent on the landscape surface.

Low SBS areas with canopy and understory cover are similar to background erosion potentials. Soil features such as intact roots, soil structure, and surface litter associated with low SBS require greater energy flow to cause erosion. Erosion from low SBS areas increases in high sloping areas lacking rock fragments and rough surface features. Erosion potential is also expected to increase in all SBS areas lacking vegetative cover where livestock use is common.

X. Sediment Potential:

The potential for sediment delivery to streams is highly dependent on the erosion potential as previously described by proximity to stream channels, and riparian characteristics and condition. Areas with steep, long, and concave slopes adjacent to streams, with little surface roughness have the highest inherent sediment delivery potential, with increased potential as SBS increases from low to high. Riparian areas with high surface roughness, wide valley bottoms, lower angle slopes, and intact vegetation have higher effective sediment buffering potential compared to narrower and steeper valley bottoms with sparce vegetation. Riparian areas with high and moderate SBS decrease the riparian vegetation effectiveness to varying extents due to the loss of soil cover and consumption of some of the surface roughness provided by downed wood and other organic material.

The landscape within Morgan Fire perimeter has low and unburned SBS adjacent to streams and less sloping morphology adjacent to riparian areas which decrease sedimentation potential in the area. As the PNW continues to experience the effects of climate change, there is an expectation of more intense precipitation events that can exceed the beneficial effects of scorched duff and needle cast that will result in an intense pulse of sedimentation in some areas of the fire perimeter that are very likely associated with high and moderate SBS.

Sediment potential increases in all areas where livestock use is common and vegetative cover is lacking. Overall, the entire fire has a moderate to low risk for sedimentation to the stream system within the first year because of the amount of intact scorched surface litter, lower sloping areas adjacent to streams, and the amount of live vegetation present in the area. As soils stabilize in moderate areas with recovering vegetation and increased needle cast, sediment potential diminishes to background levels.

Y. Estimated Vegetative Recovery Period (years): Understory vegetation recovery is expected within 1 to 5 years and overstory recovery is expected with 10 – 30 years, depending on burn severity.

Z. Estimated Hydrologic Response (brief description): The Morgan Fire burned with a mosaic of low, moderate, and high burn severity within South Creek HUC12 sub watershed contributing to the Upper Chewaucan River HUC10 Watershed. A peak flow analysis was conducted at three pour points representing BAER critical values, using regression equations calibrated to rural, unregulated basins in Eastern Oregon (OWRD, 2006). Model outputs are expected to mimic peak flows primarily caused by snowmelt or rain-on-snow events from January – May. The Q2, or the peak flow event with a 50% chance of occurring annually, was estimated for pre-fire and post-fire conditions. Model predictions indicate that peak flows at modelled poursheds will see very little increase from pre-fire conditions, 0.1 to 0.4 magnitude increase, except for the tributary to South Creek. That pourshed could see 1.8 magnitude increase from pre-fire condition. Additionally,

watershed response will likely include an initial flush of ash and burned materials, rill and gully erosion in drainages on steeper slopes in the burned area, increased sediment transport and deposition. No hydrology/watershed treatments are recommended.

Peak flow and watershed responses are highly dependent on storm occurrence and are at greatest risk in the first year or two after the fire, with emphasis on initial storm events. Disturbances will become less evident as vegetation is re-established, providing ground cover that reduces erosion and increases surface roughness to slow flow accumulation and increase infiltration. These processes will attenuate over time and should recover to pre-fire rates over the next 2-5 years.

PART V - SUMMARY OF ANALYSIS

Introduction/Background
The fire was discovered on the

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

Only the Values-at-Risk (VAR) that warranted treatments as determined using the Critical Value Matrix are represented in this 2500-8. See the Project Record for the full listing of all the VARs that the team evaluated.

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):** Trails and Roads – Singage at both ends of the fire perimeter where FSR 2800019 cuts through the burned area.

Life/ Property/ Resource	Value at Risk	Threat to Value	Probability of damage or loss	Rational for Probability	Magnitude of Consequences	Rational for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
Life and Safety	Human Life	Use of area for recreation	Very Likely	Affected roads are used to access other parts of the forest	Moderate	Previously burned areas adjacent have post-fire notification	**Very High**	Additional signage	Add signs at both ends of FSR 2800019 where it crosses perimeter

2. **Property (P):**

Life/ Property/ Resource	Value at Risk	Threat to Value	Probability of damage or loss	Rational for Probability	Magnitude of Consequences	Rational for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
Roads	FSR 2800019	Filled ditches and plugged culverts can lead to road damage	Possible	SBS up-slope of area will result in flow over road causing damage to the road surface and down slope support	Major	Road damage but not likely do blow out the road but could make it impassible	**High**	Clean culvert and ditches; upsize culverts; rolling dips for flow relief	Clean ditch and culverts
Roads	FSR 2800050	Filled ditches and plugged culverts can lead to road damage	Possible	Filled ditches and plugged culverts may result in road damage	Minor	Unburned and low SBS above road should expect same volume post-fire	Low	Clean culvert and ditches; upsize culverts; rolling dips for flow relief	Clean ditch and culverts
Roads	Culverts	Culvert size and	Possible	Small culvert size	Moderate	Post-fire debris may	Low	Make sure ditches and	Clean ditches and culverts.

		upslope drainage area may not handle flow post-fire				add to flow volume		culverts are cleaned.	
Other – Fence	Boundary / Range Fence	Lack of livestock management and movement between forest service and private rangeland	Very Likely	No influence on where cattle move	Minor	Rangeland is in good condition	Low	Repair fencing between FS lands and Private lands	

3. **Natural Resources (NR):** Native Plants/Vegetation

Life/ Property/ Resource	Value at Risk	Threat to Value	Probability of damage or loss	Rational for Probability	Magnitude of Consequences	Rational for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
Other-IRA	Inventoried roadless area	Reuse of firebreak for road into the future	Likely	Nothing to stop access where vehicles were previously blocked	Minor	No sensitive species, Elk, and Deer habitat.	Low	Close road by suppression repair	Ensure road is closed or drop trees to block access.
Soil and Water	Soil Productivity	Soil Erosion	Possible	Duff, ash cover, and needle cast cover most of the affected area	Moderate	Short slopes, existing scorched duff, needle cast, intact soil structure, and rock cover will disrupt flow	Intermediate	Hillslope mulch in moderate and high SBS area	None, considered but not recommended due to high cost and likelihood of natural recovery is very good.
Soil and Water	303d listed streams: Morgan Creek and South Creek and tributaries; hydrologic function on NFS lands	Water temperature and quality; stream flows	Possible	Moderate and high SBS mosaic in the area will result in some turbidity and slight increase in post-fire runoff	Minor	Moderate SBS has intact scorched duff, soil structure, needle cast and low or no SBS adjacent to streams. Likely ash pulse with first rains	Low	None	None
Native Plants	Canada thistle and ventenata in and around burned area	Spread and increase of weeds	Likely	Presence of weeds adjacent to burned area	Moderate	Spread of weeds to areas where weeds are absent or present in only minor amounts	High	Survey and treat in fires disturbed areas	Survey and spray
Native Plants	Native plants	Spread and increase of weeds	Likely	Presence of weeds adjacent to suppression roads	Moderate	Spread of weeds to areas where weeds are absent or present in only minor amounts	High	Survey and treat along roads, dozer lines, and suppression disturbed areas	Survey and spray

4. **Cultural and Heritage Resources:** No treatments prescribed.

B. **Emergency Treatment Objectives:**

Proposed Land Treatments
The objective of the land treatment is to:

1. Promote and protect native and naturalized vegetative recovery by reducing the spread of known populations of noxious weeds (P1a).
2. Retard the spread of invasive weeds because of suppression activities (P1b).
   NOTE: No active land treatments are recommended for long-term soil productivity and hydrologic function. Allowing for natural recover is the recommended course of action.

Proposed Road and Trail Treatments
The objective of road treatments are to:

1. Protect road investments from damage or loss due to increased post-fire runoff and erosion by monitoring and maintaining ditch line and culvert inlet capacities (R1).
2. Protect road investments by monitoring post rain event to ensure runoff doesn't plug culverts or ditches that can easily be removed (R3).

Proposed Protection/Safety Treatments
The objective of the protection/safety treatments are to:

1. Protect human life and safety by raising awareness through posting hazard warning signs along roads and trails entering the burned area to warn users of potential hazards resulting from post-fire conditions (S1a).

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: EDRR not necessarily influenced by damaging storm or event.
Channel: NA
Roads/Trails: Possible
Protection/Safety: Likely

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land	Probably	Likely	Likely
Channel	NA	NA	NA
Roads/Trails	Likely	Likely	Very Likely
Protection/Safety	Likely	Likely	Very Likely

E. Cost of No-Action (Including Loss): $970,000

F. Cost of Selected Alternative (Including Loss): $330,000

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Lori Crumley (FRE-WIN) / Brien Park (UMA)
Email: lori.crumley@usda.gov / brien.park@usda.gov **Phone(s)** 541-219-9942 / 541-969-3342

Forest BAER Coordinator: Lori Crumley
Email: lori.crumley@usda.gov **Phone(s):** 541-219-9942

Team Members: Table 7: BAER Team Members by Skill

Skill	**Team Member Name**
Team Lead(s)	Lori Crumley (FRE-WIN), Brien Park (UMA)
Soils	Brien Park (UMA), Lori Crumley (FRE-WIN)
Hydrology	Rich Pyzik (UMA)

Skill	Team Member Name
Engineering	Shaun Oliver (UMA)
GIS	Kim Vieira (DRM)
Archaeology	NA
Weeds	Lori Crumley (FRE-WIN)
Recreation	NA
Other	NA

H. Treatment Narrative:

Land Treatments: Invasive Plants: Conduct EDRR where vectors for the expansion of invasive species have been increased or enhanced to ameliorate the risk to native plant communities (P1a, P1b). These include areas where suppression activities disturbed documented sites where invasive plants grow, and areas where moderate and high SBS are adjacent to non-infested native vegetation. Existing treatment contracts and agreements with local county and SWCD or other entities to be utilized.

Post-fire monitoring would occur the following year to identify threats from invasive species by conducting early detection and initiating a rapid response. Post-treatment monitoring could be expected to evaluate invasive treatment effectiveness too. Monitoring for erosion and runoff impacts to road drainage structures would take place after storms and heavy rains to identify any needed clean-out as identified under roads treatments.

Table 7. Invasive Plant treatments and associated costs.

Treatments	Unit	Unit Cost	# of Units	Total Cost
P1a. EDRR - Invasive Plant Treatments	Acre	$280.00	50	$14,000.00
P1a. EDRR - Invasive Plant Surveys/Detection (High Probability Annual Invasive Grass)	Acre	$18.00	81	$1,458.00
P1b. Suppression - Invasive Plant Surveys/Detection (Dozer Lines and roads)	Acre	$18.00	350	$6,300.00
P1b. Suppression - Invasive Plant Surveys/Detection (Safety Zones, Drop Points, Staging, Helistops)	Acre	$18.00	30	$540.00
Total Amount Requested				$22,298.00

Channel Treatments: NA

Roads and Trail Treatments: Storm inspection and response – Patrol FSR 2800019 after storms and wet weather to detect the need for ditch or culvert clean-out where post-fire erosion and runoff has impeded drainage (R1). Storm Proofing – Clean ditches and culverts on FSR 2800019 to handle post-fire slows, sediment and debris (R3). Analysis on culvert capacity post fire determined that no culverts needed to be replaced with larger capacity culverts based on SBS map.

Table 8. Storm Proofing treatments and associated costs.

Treatment	Unit	Unit Cost	# of Units	Total Cost
R1. Storm Proofing (existing structures) – 2800019, Jct of RD 28 to 2800050	Storm	$6,500	2	$13,000
R3. Storm Inspection and Response - FSR 2800019, Jct of RD 28 to 2800050	Day	$2,150	8	$17,200
				$30,200

Protection/Safety Treatments: Road Warning Signs – Signs placed at both ends of FSR 2800019 where it crossed the fire perimeter will inform the public of entering an area with possible dangers in a post-fire landscape (S1a).

Treatment	Unit	Unit Cost	# of Units	Total Cost
S1a. Road Hazard Signs, FSR 2800019 at Jct of RD 28 and 2800050	Sign	$800	2	$1,600
				$1,600

I. Monitoring Narrative: NA

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
P1a. Invasives EDRR, Mon	Acres	18	81	$1,458	$0		$0		$0	$1,458
P1a. Invasives EDRR, App	Acres	280	50	$14,000	$0		$0		$0	$14,000
P1b. Invasives EDRR-Sup	Acres	18	380	$6,840			$0		$0	$6,840
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$22,298	$0		$0		$0	$22,298
B. Channel Treatments										
				$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										
R1. Storm Proofing (exist)	Miles	6,500	2	$13,000	$0		$0		$0	$13,000
R3. Storm Inspec and Resp	Days	2,150	8	$17,200	$0		$0		$0	$17,200
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$30,200	$0		$0		$0	$30,200
D. Protection/Safety										
S1a. Road Hazard Signs	Sign	800	2	$1,600	$0		$0		$0	$1,600
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$1,600	$0		$0		$0	$1,600
E. BAER Evaluation										
Initial Assessment	Report			$22,281	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$22,281	$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				$54,098	$0		**$0**		**$0**	**$54,098**
Previously approved										
Total for this request				**$54,098**						

PART VII - APPROVALS

Forest Supervisor Date