

Date of Report: 8/17/2023**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:** Diamond Fire**B. Fire Number:** 2023-AZTNF-001046**C. State:** AZ**D. County:** Maricopa**E. Region:** 3**F. Forest:** Tonto NF**G. District:** Mesa RD**H. Fire Incident Job Code:** P3QEZ0**I. Date Fire Started:** 07/22/2023 4:16 PM**J. Date Fire Contained:****K. Suppression Cost:****L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

- 1. Fireline repaired (miles):** See Diamond Fire Suppression Damage Repair Plan
- 2. Other (identify):**

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

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
150602030508	Alder Creek	10776.24	730.62	6.78%
150602030604	Middle Sycamore Creek	32909.65	1388.34	4.21%
150602030601	Upper Sycamore Creek	39535.42	3061.63	7.74%

N. Total Acres Burned:*Table 2: Total Acres Burned by Ownership*

OWNERSHIP	ACRES
NFS	5180.16
OTHER FEDERAL (LIST AGENCY AND ACRES)	0
STATE	0
PRIVATE	.33
TOTAL	5180.59

O. Vegetation Types:

Distribution of vegetation types mapped: Mojave Sonoran Desert Scrub (5%), Grassland (8%), and Juniper Woodland (87%). The majority of the area is mapped as Terrestrial Ecological Unit Inventory map unit 450 with *Juniperus coahuilensis* as the dominant overstory species. This ecosystem type is documented to have very patchy interstitial spaces between areas of higher fuel loading underneath tree and shrub canopies.

P. Dominant Soils:

A variety of slope angles and slope lengths make up these landforms that allow for a variety of soil types to form with old alluvium accumulation at footslopes creating deeper soils and shallower soils found on the steeper slopes. This area is comprised of Terrestrial Ecological Unit Inventory (TEUI) map units (MU): 250, 326, 432, 4050, and 450. Multiple soil types can be found across these map units including: Ashy-skeletal, glassy, thermic Lithic Ustic Haplargids (TEUI MU 250); loamy-skeletal, mixed, superactive thermic Aridic calciustepts (TEUI MU 326); clayey-skeletal, smectitic, thermic Typic Haplustalfs (TEUI MU 432); and fine, smectitic, thermic Typic Haplustalfs (TEUI MU 4050); thermic Typic Haplustalfs (TEUI MU 450). The most common soil type found in the burn scar is MU 450 which is the soil order known as an Alfisol.

Q. Geologic Types:

Bedrock on the hill and mountain slopes are derived from extrusive and intrusive igneous rock (granite, basalt, and dacitic/rhyolitic tuff), some sedimentary rock, and other mixed sources.

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	0
INTERMITTENT	2.11
EPHEMERAL	37.64
OTHER (DEFINE)	0

S. Transportation System:

Trails: National Forest (miles): 5.74 Other (miles): NA

Roads: National Forest (miles): 1.61 Other (miles): NA

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

Soil Burn Severity	NFS	Other Federal (List Agency)	State	Private	Total	% within the Fire Perimeter
Unburned	1749.1	0	0	0.33	1749.4	33.8%
Low	1638.0	0	0	0	1638.0	31.6%
Moderate	1552.5	0	0	0	1552.5	30.0%
High	241.0	0	0	0	241.0	4.7%
Total	5180.6	0	0	0	5180.6	100%

B. Water-Repellent Soil (acres):

Soil water repellency is found in soils that underwent high and moderate soil burn severity: 1,793.4 acres

C. Soil Erosion Hazard Rating:

Severe Soil Erosion Hazard: TEUI Map Unit 250, Sonoran Desert, 250.60 acres

Moderate Soil Erosion Hazard: All remaining acres from grassland to juniper woodland

D. Erosion Potential:

Terrestrial Ecological Units with the conditions closest to a high erosion potential were analyzed and identified on the assessment area utilizing ArcGIS Pro. Units with high erosion potential meet all the following criteria A) rate severe for soil erosion hazard, B) contain moderate or high soil burn severity, and C) have a moderate and high soil burn severity average of tons/acre sediment delivery of 3 times the rate of the unit's reported soil loss tolerance under untreated conditions. No acres qualified for a severe soil erosion hazard.

E. Sediment Potential:

Taking the sediment delivery from the 1-year storm event, the soil loss tolerance is exceeded for the moderate and high soil burn severity areas of map unit 450 (1651.1 acres) with 8.9 and 10.1 tons/acre loss respectively. This is still a relatively small amount of soil loss; 150 tons/acre loss is about an inch of soil loss from the surface. All other map unit sediment deliveries from both the 1 and 10 year storm event do not surpass soil loss tolerance.

F. Estimated Vegetative Recovery Period (years):

2-5 years

G. Estimated Hydrologic Response (brief description):

Minimal < 100% increase

Significant = 100-200% increase

Very Significant = 200-800% increase

Extreme > 800% increase

12 Digit HUC Number	12 Digit HUC Name	River Reach Name	50% Chance Flow Change Pre-Post Fire	50% Chance Hyper-concentrated Flow Change Pre-Post Fire	20% Chance Flow Change Pre-Post Fire
150602030604	Middle Sycamore	Middle Sycamore with pour point at MT-1333	Significant	Significant	Minimal
150602030601	Upper Sycamore Creek	At top of 72 trail	Extreme	Extreme	Very Significant
		Along AZ Trail -1	Very Significant	Very Significant	Very Significant
		Bottom of modelled watershed above private	Very Significant	Very Significant	Very Significant
		Along AZ Trail -2	Very Significant	Extreme	Very Significant
		Along AZ Trail -3	Very Significant	Very Significant	Very Significant
		Along AZ Trail -4	Minimal	Significant	Minimal
		Bottom of modelled watershed draining to Sycamore Creek	Very Significant	Very Significant	Significant

PART V - SUMMARY OF ANALYSIS

Introduction/Background

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):

Life and safety on National Forest System Trails and dispersed recreation areas is a risk.

- The probability to loss of life or injury of recreationalists is **very likely** for trail users on the Arizona Trail.
- The probability of loss of life or injury of recreationalist is **very likely** for trail users on FS trail #76 the Diamond Trail.
- The probability of loss of life or injury of recreationalists is **unlikely** for dispersed recreation and motorized recreationalists on MT-393.
- The probability of loss of life or injury of recreationalists is **possible** for dispersed recreationalists and motorized recreationalists on MT-2143.

2. **Property (P):** NF # 344 (Part of the Arizona National Scenic Trail): The AZ trail throughout burn scar has multiple areas where chance for runoff for 50% storm will be very significant or extreme.

- b. NF # 76: The trail throughout burn scar has multiple areas where chance for runoff for 50% storm will be very significant or extreme.
- c. NF # MT-393: Just barely in burn scar with very low risk.
- d. MF # MT-2143: Below area of minimal flood risk with low risk.

1. Natural Resources (NR):

After field validation, the minimal impacts to soil structure and the overall sediment delivery potential estimated for a 1-year event and for most of the acreage in a 10-year event are not of immediate concern. There is not a need for mitigating soil erosion because the estimated threat does not pose a severe risk to the maintenance of Soil productivity in the Diamond fire burn scar. Post-fire vegetative recovery and maintained soil health would benefit greatly from a rest period from grazing; however, this is not a critical value risk.

4. Cultural and Heritage Resources:

Based on the inventory given during the Diamond Fire and BAER evaluation, 33 cultural resource sites are located on National Forest System lands area within the Diamond Fire are eligible for the National Register of Historic Places (NRHP). Evaluation of Cultural Resource concerns indicated 15 sites in the Diamond Fire area having values at risk of damage to or total loss of site context and elements resulting from looting, vandalism, erosion, and/or flooding (see Table 1 in Cultural Resources specialist report). Looting and Vandalism risk factors are conveyed by the burn severity, where an archaeological site is located. The higher burn severity indicated by the Diamond Fire - Soil Burn Severity (SBS) data provided by Terrestrial Ecological Unit Identifier (TEUI), the higher the exposure for sites previously covered and concealed.

Risk Assessment: 15 sites in the Diamond Fire area have been identified as having values at risk of damage to or total loss of site elements resulting from looting, vandalism, and/or erosion. Due to the probability of loss determination and associated magnitude of consequences resulting in a high to very high risk for these sites, a BAER emergency pertaining to heritage resources exists in the Diamond Fire area.

B. Emergency Treatment Objectives:

Recreation resource treatment objectives is to minimize potential damage from post fire flooding.

Cultural Resources Treatment Objectives considered:

- Looting and vandalism mitigation
- Provide appropriate/revised site data to mitigate additional treatment applications.
- Ensure site location and features and/or subsurface cultural material are not damaged or exposed by erosion or severe soil movement.

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

Land: N/A

Channel: N/A

Roads/Trails: Good

Protection/Safety: Good

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land			
Channel			
Roads/Trails	Good	Good	Good
Protection/Safety	Good	Good	Good

E. Cost of No-Action (Including Loss): Possible loss of human life and or injury, damage to NFS trails systems, and damage to cultural resources.

F. Cost of Selected Alternative (Including Loss): \$16,805

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Mike Martinez

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Forest BAER Coordinator: Kelly Mott Lacroix

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Phone(s): 480-601-6218

Team Members: Table 7: BAER Team Members by Skill

Skill	Team Member Name
<i>Team Lead(s)</i>	Mike Martinez
<i>Soils</i>	Jalene Weatherholt
<i>Hydrology</i>	Kelly Mott Lacroix, Haley Bull (T)
<i>Archaeology</i>	Emery Manuel (AD)
<i>Recreation</i>	Ron Turner
<i>Other</i>	

H. Treatment Narrative:

Land Treatments: None

Channel Treatments: None

Roads and Trail Treatments:

Recommended Response Actions for Trails:

- 2.6 miles of the Arizona National Scenic Trail
 - ☐ Trail stabilization treatments and upslope sediment flow mitigation should be considered in areas where loss of life or injury are very likely.
 - ☐ Cost for trail stabilization and upslope sediment mitigation has been estimated at \$16,500 for a trail crew hitch to be placed in an agreement with ATA and or AZCC.
- Life and safety in dispersed recreation areas
 - ☐ Fire hazard signs should be installed at other motor vehicle access points and trailheads along the fire's perimeter at a cost of \$305 for 7 total signs.
- 2.09 miles of FS # 76 Diamond Trail
 - ☐ Trail stabilization or decommissioning are recommended for this trail with the decision to be made by the Mesa District Ranger.

- ☐ If stabilization is considered funding for the work will need to come from project dollars and or through local trail volunteer events. *No BAER treatments are recommended.*
- 4. MT-393 and MT-2143
 - ☐ *No BAER treatments are recommended* with the exception of the above-mentioned fire hazard warning signs.

Protection/Safety Treatments:

The proposed treatments for trails described above addresses both the property and life and safety values provided by trails assessed in this report.

Cultural Resource Treatments recommended:

- A temporary closure of area for natural soil restoration, in conjunction of additional treatment objectives for other resource concerns.
- Qualified archaeologist and/or archaeological technicians to perform extended site location survey to accurately identify site location. Whereas site location/condition would support treatment mitigations and update site card information for Tonto National Forest Archaeological/Heritage Program.

I. Monitoring Narrative:

Implementation of treatments will be monitored by the Forest BAER Coordinator in coordination with the applicable program or District specialist.

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands				All Total \$
			# of Units	BAER \$		# of units	Fed \$	# of Units	Non Fed \$	
A. Land Treatments										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				\$0	\$0		\$0		\$0	\$0
B. Channel Treatments										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
AZCC Trail Crew	Hitch	16,500	1	\$16,500	\$0		\$0		\$0	\$16,500
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road and Trails</i>				\$16,500	\$0		\$0		\$0	\$16,500
D. Protection/Safety										
Warning signage 12x18	Sign	29	3	\$87	\$0		\$0		\$0	\$87
Warning signage 18x18	Sign	42	4	\$168	\$0					\$168
Sign production charge	Fee	50	1	\$50	\$0		\$0		\$0	\$50
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				\$305	\$0		\$0		\$0	\$305
E. BAER Evaluation										
Initial Assessment	Report	\$12,529	1	---	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				\$0	\$0		\$0		\$0	\$0
F. Monitoring										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$0	\$0		\$0		\$0	\$0
G. Totals				\$16,805	\$0		\$0		\$0	\$16,805
Previously approved										

PART VII - APPROVALS

1. _____
 Forest Supervisor Date