

Date of Report: July 21, 2019 (revised July 25, 2019)

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 # 1
 - ☒ Updating the initial funding request based on more accurate site data or design analysis

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Woodbury

B. Fire Number: AZ-TNF-000579

C. State: Arizona

D. County: Maricopa, Pinal, Gila

E. Region: R3

F. Forest: Tonto NF

G. District: 02, 03, 06

H. Fire Incident Job Code: P3I951

I. Date Fire Started: 06//08/2019

J. Date Fire Contained: 7/15/19

K. Suppression Cost: \$25,000,000

L. Fire Suppression Damages Repaired with Suppression Funds (estimates): Click here to enter text.

- 1. **Fireline repaired (miles):** 14.1
- 2. **Other (identify):** Road as completed line: 13.7

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

HUC #	Watershed Name	Total Acres	Acres Burned	% Watershed Burned
150601060103	Apache Lake-Salt River	29,477	3,155	11%
150601060102	Buckhorn Creek-Salt River	18,351	663	4%
150601030705	Campaign Creek	21,394	18,634	87%
150601030910	Cottonwood Creek-Salt River	14,766	6,085	41%
150601060105	Fish Creek	25,674	17,915	70%
150501000404	Hewitt Canyon	19,808	2,422	12%
150601060107	La Barge Creek	27,388	8,048	29%
150601060104	Lewis and Pranty Creek	10,309	8,776	85%
150601030706	Lower Pinto Creek	22,943	2,592	11%
150601030704	Middle Pinto Creek	23,090	4,906	21%
150601060101	Pine Creek	23,021	17,552	76%
150601030909	Schell Gulch-Salt River	29,247	4,956	17%
150601060106	Tortilla Creek	20,708	12,120	59%
150601030702	West Fork Pinto Creek	18,143	6,983	45%
150501000801	Whitlow Canyon	23,724	10,598	45%

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

OWNERSHIP	ACRES
NFS	125,329
OTHER FEDERAL (LIST AGENCY AND ACRES)	National Park Service 994 acres
STATE	75 acres
PRIVATE	194 acres
TOTAL	126,591 acres

O. Vegetation Types: 32,107 acres grassland, 2,291 acres riparian, 61,078 acres shrubland, 27,701 acres woodland

P. Dominant Soils: Lithic Ustic Haplocambids, Ustic Haplocambids, Ustic Haplargids, Aridic Haplustalfs, Lithic Haplustalfs, Aridic lithic Ustorthents, Typic Haplustalfs, and Lithic Argiustolls.

Q. Geologic Types: Proterozoic age granite, sandstone, and lime stone, Miocene age Rhyolitic and Dacitic Tuff, and Pleistocene age alluvium

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	7.3 miles
INTERMITTENT	46.6 miles
EPHEMERAL	109.8 miles

**OTHER
(DEFINE)**

S.

Transportation System:**Trails:** National Forest (113 miles):

Other 0 (miles):

Roads: National Forest (53.1 miles):

State Hwy 88 (Apache Trail) (14.85 miles):

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

Soil Burn Severity	NFS	Other Federal (NPS)	State	Private	Total	% within the Fire Perimeter
Unburned	30,359	195	21	168	30,743	24
Low	67,799	796	53	25	68,673	54
Moderate	26,605	2			26,608	21
High	566				566	0.5
Total	126,591	993	74	193	126,591	

B. Water-Repellent Soil (acres): 13,868 acres**C. Soil Erosion Hazard Rating:** severe 71,226, moderate 51,267, low 3,562, NA ,**D. Erosion Potential:** 1.8 tons/acre **Sediment Potential:** 643.7 cu yds/sq mi**F. Estimated Vegetative Recovery Period (years):** 5-10 yrs**G. Estimated Hydrologic Response (brief description):**

Most of the area within the fire perimeter burned with low soil burn severity (54%) or lies within the unburned/very low burn severity category (24%). Areas of moderate soil burn severity occupy about 21 percent of the burned area. Areas of high soil burn severity occur in less than one percent of the burned area.

Watersheds with the greatest percentage of moderate burn severity include Campaign Creek (25% moderate severity), West Fork Pinto Creek (34%), Lewis and Pranty Creek (11%) and Pine Creek (20%). Peak flows expected from the 10 yr 1-hr storm will increase by more than 100% from prefire peak flows in these watersheds. The first storm or two following the fire on the burned area can produce even higher peak flows as sediment and fire debris (including ash) is washed from the watersheds.

PART V - SUMMARY OF ANALYSIS**Introduction/Background**

The Woodbury Fire burned approximately 125,000 acres of sonoran desert, semidesert grassland, chaparral, and pinyon-juniper, with smaller inclusions of ponderosa pine, primarily within the Superstition Wilderness. The wilderness is immediately adjacent to the Phoenix metropolitan area and is criss-crossed by many miles of trails. Approximately 110 miles of trails including 26 miles of the Arizona Trail (a National Scenic Trail). are within the burn perimeter. Several of the watersheds within the burned area drain to three major reservoirs that are popular recreation destinations for users from the Phoenix Metropolitan area. A number of dispersed and developed recreation sites are located along these reservoirs at the mouths of washes that drain the burned area. Users of these sites are threatened by flash floods and debris flows from the burned area. Approximately 68 miles of roads lie within the burned area perimeter and a number of additional roads cross streams and washes below the burned area. The Apache Trail lies along the northern boundary of much of the burned area. The road is operated under a road easement issued to the Arizona Department of Transportation but lies on National Forest System (NFS) lands. It is an historic road constructed to facilitate building of Roosevelt Dam in the early 1900's. The road contains a number of cultural resources that are threatened by postfire runoff and erosion.

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):

- a. Threats to human life and safety exist where users of National Forest System (NFS) roads are exposed to flash floods, debris flows, rolling rocks, and falling trees or limbs. There are 53 miles of NFS roads within the burned area that are open to the public. An additional 15 miles of administrative roads are accessible to Forest Service employees, contractors and other permitted users. NFS roads with the greatest threat to the life and safety of users include:

FSR 449A that provides access to Reavis Mountain School, the headquarters for the Cross P Ranch, other connecting roads within the burned area, dispersed camping sites, and a Trailhead that provides access into the Superstition Wilderness. This road passes up the main channel of Campaign Creek in one location and crosses the channel at 3 other locations. Campaign Creek. 72 percent of the watershed above Reavis Mountain School burned with moderate to high soil burn severity. The potential for flash flooding and debris flows has increased substantially in this watershed. There is a moderate flash flood hazard from the 1, 2, and 5 year recurrence interval storms and a high hazard from the ten year recurrence interval storm.

FSR 83 provides access to a permitted private residence on NFS lands, to a trailhead into the superstition wilderness, and dispersed campsites on NFS lands. There is a moderate potential for debris flow and low to moderate potential for flash flooding in the washes crossed by this route.

FSR 212 provides access to a popular trailhead for the Superstition Wilderness and access to dispersed camping sites. It is constructed on highly erosive soils and at high risk of damage from storms. It is at moderate risk of debris flows that are a threat to life and safety.

FSR 213 lies entirely within the burned area. This road is a cherry stem that travels approximately three miles into the Superstition wilderness and ends at the Tortilla Trailhead where dispersed camping occurs in close proximity to Tortilla Creek. Increased flash flood hazard occurs in Tortilla Creek.

FSR 650 and 172A are a popular loop drive by OHV users. The routes provide access to a wilderness trailhead and to dispersed camping areas. Debris flow hazard ranges from low to high along this route. Rolling rocks from burned hillsides are also a threat to poorly protected OHV users.

Other roads (both NFS roads state highways) that pass below the burned area also represent threats to life and safety where they cross washes that drain the burned area where the threat of flash flooding has increased.

In addition to users of NFS roads, the burned area is also bordered by State Highway 88, also known as the Apache Trail. This road parallels Fish Creek for approximately one mile, Lewis and Pranty Creek for about 1.5 miles and an area of highly erosive decomposed granite that has been burned for another two miles. Rock fall, and flash floods are a threat to users of this road.

- b. Approximately 113 miles of trails travel through the burned area. These trails pass through drainage bottoms, along steep slopes, and through forested areas. Threats to the life and safety of users of these trails exist from flash floods, debris flows, rolling rocks, and falling limbs and trees. Threats from debris flows are greatest in some of the higher mountainous

country in the headwaters of Fish Creek, Pine Creek, Campaign Creel, and West Fork of Pinto Creek where burn severity is also higher. Smaller areas of high debris flow hazard exist in the headwaters of LaBarge Creek and Lewis and Pranty Creek. Flash flood hazards are also elevated substantially in these watersheds.

- c. Recreation sites. Two developed recreation sites have been developed in washes that drain the burned area where these washes discharge into Apache Lake. Eighty percent of the watershed above the Davis Wash Recreation site was burned in the fire. The recreation site is located where the wash empties into Apache Lake. The threat of flash flooding has increased substantially and ranges from moderate for the one and two year storms to high for the five year and extreme for the ten-year storms.

The Crabtree Wash recreation site is located where Crabtree Wash enters Apache Lake and lies immediately adjacent to the Apache Lake Marina. The site contains recreation residences as well as developed recreation facilities. Forty-two percent of the watershed above the site was burned. Flash flood hazard ranges from high for the one year storm to extreme for the 2-10 year storms.

Other developed recreation sites occur along Roosevelt Lake. These sites are primarily outside the floodplain of washes draining the burned area but recreational use and dispersed camping does occur at the mouths of some of these washes. Boat-in recreational use also occurs at the mouths of washes draining the burned area in Canyon, Apache, and Roosevelt Lakes. Areas of particular concern would include the Boat storage area at the Roosevelt Lake Marina, The mouths of Cottonwood Creek, Cave Creek (which passes through Tonto National Monument), an unnamed tributary to Roosevelt Lake that passes along the east side of the Windy Hill Recreation sites, Schoolhouse Wash, and the unnamed wash that passes through the Schoolhouse Recreation Site.

There are also popular dispersed recreation sites along Fish Creek, Tortilla Creek, Mesquite Wash, Pinto Creek, Miles Ranch, and Boulder recreation site on Canyon Lake at the mouth of LaBarge Canyon. The Apache Lake Vista Recreation site occupies a small area immediately adjacent to the burned area along the Apache Trail at the turnoff to the Apache Lake Marina. Dispersed camping, particularly during hunting season occurs throughout the burned area and on NFS lands below the burned area.

- d. Threats to life and safety also exist for residents on private lands along streams draining the burned area. Private residences exist on Campaign Creek, Pinto Creek, Spring Creek, Lewis and Pranty Creek, Cottonwood Creek, Wildcat Wash, and Whitlow Canyon. Privately owned structures at Tortilla Flat may also be at risk of flash flooding.
 - e. Tonto National Monument is within the burned area and is drained by Cave Canyon. Flash flood risks have increased in Cave Canyon have increased as a result of the fire. Flash flood risks range from moderate from the one to two year storms, high for the five year storm, and extreme for the ten year storm. Travelers on the road into the monument as well as infrastructure at the monument may be at risk from flash floods.
2. **Property (P):** National Forest System property at risk includes the roads listed above as well as lesser used roads not described above and NFS roads that cross washes below the burned area. In total there are approximately 68 miles of NFS roads within the burned area that would be at risk from erosion, overtopping of drainage structures, flash floods, debris flows, rock fall, and hazard trees. National forest system trails within and below the burned area would be subject to the same hazards as the roads threatened by post fire conditions. One hundred thirteen miles of trails lie within the wilderness portion of the burned area and an additional several miles lie outside the wilderness.

The Woodbury fire heavily impacted Passage 19 of the Arizona National Scenic Trail spanning the Superstition Wilderness from Rogers Trough Trailhead on the east, to Vineyard TH on the north adjacent to Roosevelt Lake. Of the 29.4 total miles of Passage 19, 25.87 miles were within the perimeter of the Woodbury Fire. This portion of the Arizona Trail covers Forest System Trails: Reavis Ranch (109), Reavis Gap (117), Two Bar (119), and Cottonwood (120). These trails were burned at varying degrees of low, moderate, and high severity. Remaining hotspots within the burn perimeter, have limited the information available as to the degree of damage that has occurred.

In addition to the trail infrastructure itself infrastructure at trail heads and signs along the trails may be damaged as well. Developed Recreation sites exist below the burned area In Crabtree and Davis Washes, at the turnoff from the Apache Trail to the Apache Lake Marina, along Roosevelt Lake and Canyon Lake and at Tortilla Flat.

3. **Natural Resources (NR):** In general, fire effects are within natural occurring ranges for the affected vegetation types except for the Sonoran desert portion of the burned area where frequent fire is not a natural component of the ecosystem. Widespread invasion of the desert by red brome (an annual nonnative grass) has increased the frequency of fire in this ecosystem and results in mortality to many native desert trees and cacti. Damage to soil productivity is primarily in isolated areas of high burn severity.

Within this assessment regarding invasive the factors to consider were: importance of the threatened area, proximity to invasive plant and weed source areas and likely transmission vectors; specific plant characteristics, such as method of spread, seed viability, growth rate, response to fire, etc.; severity of fire effects and expected recovery rate/resilience of existing vegetation; state-listed noxious status or category of invasive plant. Within the weeds analysis roadways, hand-lines, dozier-lines, base camps, spike camps, and drainages were observed for noxious weeds as well as the potential for them to have noxious weeds. Upon primary observation the following weeds were observed: fountain grass (*Pennisetum ciliare*), buffle-grass (*Pennisetum setaceum*), malta star thistle (*Centaurea melitensis*) and tree of heaven (*Ailanthus altissima*).

4. **Cultural and Heritage Resources:** Primary concerns about damage to significant cultural resources for the BAER effort focuses on ground disturbance activities which may directly impact known or unknown cultural resources, the potential to bury surface and subsurface cultural resources to prohibit discovery, and the possibility of soil movement which would change the context of the remains which would be vital to any scientific analysis or interpretation value that the resource may have. The burn may also have the indirect impact of increasing the visibility of site locations to make them more susceptible to vandalism. It is assumed the same effects would hold true for any unknown cultural resources within the burn perimeter. Four sites are recommended for protection measures, one being an in-use historic road known as Highway 88/Apache Trail. The other three sites are situated along, or within view, of hiking trails. The BAER team has determined that area closures with the fire perimeter are necessary to protect life and property during the summer monsoon season. During this closure, it is expected that vegetation should start to return to these sites which would shield their visibility along the trails. After the monsoon season, archaeologists will conduct a vegetation detection survey to assess the amount of vegetation returning to the area and if it effectively conceals these sites. If the BAER team lifts the area closure, and the sites are not adequately concealed, additional treatments will be recommended.
- a. **Emergency Treatment Objectives:** Provide warnings to users of Forest service recreation sites, roads and trails of the hazardous conditions resulting from the burned area. Install gates to close hazardous areas to public entry. Improve drainage on roads and trails. Detect and remove invasive species. Inspect and repair drainage facilities damaged by post fire runoff on roads and trails within and below the burned area.

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

Land N/A

Channel 80%

Roads/Trails Roads 75%, Trails 50%

Protection/Safety Signs 95%, Gates 50%

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	70%	80%	90%
Roads/Trails	50%	60%	75%
Protection/Safety	70%	80%	100%

E. Cost of No-Action (Including Loss): \$1,615,000**F. Cost of Selected Alternative (Including Loss):** \$773,000**G. Skills Represented on Burned-Area Survey Team:**

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

Team Leader: Ryan Nicholas, Grant Loomis, Mike Martinez**Email:**ryan.nicholas@USDA.gov, moalty21@gmail.com, michael.a.martinez@USDA.gov**Phone(s)**Ryan Nicholas-337 255-9568, Grant Loomis 480 406-7352, Mike Martinez 602-499-5818**Forest BAER Coordinator:** Ryan Nicholas, Kelly Mott Lacroix**Email:**kelly.mottlacroix@usda.gov, ryan.nicholas@usda.gov **Phone(s):**602 225-5210, 602 225-5386**Team Members:** Table 7: BAER Team Members by Skill

Skill	Team Member Name
<i>Team Lead(s)</i>	Ryan Nicholas, Mike Martinez (trainee) Grant Loomis
<i>Soils</i>	Andy Casillas, David Watson
<i>Hydrology</i>	Kelly Mott Lacroix, Grant Loomis
<i>Engineering</i>	Terrin Lane
<i>GIS</i>	
<i>Trails</i>	Justin Eddinger
<i>Archaeology</i>	Kim Stroh, Clint Dalton
<i>Weeds</i>	Ryan Nicholas
<i>Recreation</i>	Sheryl Cormack
<i>Other</i>	Chad Harrold-Geology

H. Treatment Narrative

Land Treatments: Implement an early detection and rapid response effort to detect and remove invasive species. Known noxious weeds including fountain grass, buffle grass, and Malta star thistle were found at fire base camps and spike camps. Tree of Heaven was found at the margins of the burned area. Inspections to detect spread of these species along roadways, dozer lines, hand lines, spike camps, and drainages will be conducted in the spring and fall. If detected they would be grubbed or sprayed with an appropriate herbicide to eliminate or reduce the infestations. The determination and direction towards detection and removal will have to be a large effort for this fire due to its size and landscape status. Therefore the weeds specialist recommends \$30,000 for the detection and removal of invasive species on the Woodberry Fire. The breakdown and justification of funds are as follows: \$10,000 for the detection and removal of weeds for the Globe Ranger District portion of the fire; \$10,000 for the detection and removal of weeds for the Tonto Basin Ranger District portion of the fire; and \$10,000 for the detection and removal of weeds for the Mesa Ranger District portion of the fire.

Duties will be carried either by contract or by the Noxious and Invasive Weeds Program Management of the Tonto National Forest.

Channel Treatments: Remove floatable debris from channels that threaten road crossings on Campaign Creek, Lewis and Pranty Creek, Davis Wash, and Pine Creek. Floatable debris would be removed for approximately one quarter mile above the Davis Wash, and Pine Creek road crossings and for approximately one mile along Lewis and Pranty Creek where the road encroaches on the channel. Floatable debris would be removed for approximately 1-200 yards above the low water crossings on Campaign Creek.

Roads and Trail Treatments: Install flood (60) warning signs on roads, trails, and recreation sites threatened by post fire flooding and debris. Construct (23) gates on roads entering the burned area that will be closed until conditions recover sufficiently for safe access. Implement storm inspection and response to ensure road and trail drainage features are functioning properly. Storm inspection request is separated into two categories in this request for the portion of storm inspection to protect cultural resources on Hwy 88 and storm inspection on FS roads.

Trails are located remotely in Wilderness making access challenging and requiring use of primitive tools. Terrain is variable but generally steep and mountainous. Due to the remoteness of trails and miles that must be covered we propose three separate projects consisting of six hitches – 8 day trail crew assignment - totaling \$105,000 (including the additional \$1600 for signs for crew safety). There is an immediate need to prevent erosion and reduce impact to hydrologic function on 15.33 miles of the Arizona Trail within the 1st year. This will allow for trails to be reopened and meet FS trail safety standards much sooner.

Protection/Safety Treatments: Hazard signs on roads and trails (previously approved) and gated road closures would provide protection for life and safety.

Monitoring Narrative:

To be determined

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										
Weeds EDRR	ea	30,000	1	\$30,000	\$0		\$0		\$0	\$30,000
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$30,000	\$0		\$0		\$0	\$30,000
B. Channel Treatments										
floatable debris removal	mile	15,000	1	\$15,000	\$0		\$0		\$0	\$15,000
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treatments				\$15,000	\$0		\$0		\$0	\$15,000
C. Road and Trails										
Substantial closuregates	ea	10,000	7	\$70,000	\$0		\$0		\$0	\$70,000
Simple closure gates	ea	5,600	16	\$89,600	\$0		\$0		\$0	\$89,600
Strm inspcn/rspns NFS	mile	5,750	16	\$92,000						\$92,000
Trail prtctn Az Trail	mile	22,000	5	\$105,000						\$105,000
Strm-Proofng-Ap Trl	mile	4,000	10	\$0						\$0
Strm-Inspctn/rspns-Ap Trl	mile	5,000	8	\$0						\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Road and Trails				\$356,600	\$0		\$0		\$0	\$356,600
D. Protection/Safety										
Warning Signs (prvsly aprvd)	ea	225	40	\$9,000	\$0		\$0		\$0	\$9,000
additional signs	ea	125	20	\$2,500	\$0		\$0		\$0	\$2,500
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Protection/Safety				\$11,500	\$0		\$0		\$0	\$11,500
E. BAER Evaluation										
Initial Assessment	Report			---	\$0		\$0		\$0	\$0
to be determined				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				\$0	\$0		\$0		\$0	\$0
F. Monitoring										
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals										
				\$413,100	\$0		\$0		\$0	\$413,100
Previously approved				\$9,000						
Total for this request				\$404,100						

PART VII - APPROVALS

1. _____
Forest Supervisor Date