

Date of Report: 7/10/17
Interim No.3
Revised 8/9/2017

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

- ☒ 1. Funding request for estimated emergency stabilization funds
- ☐ 2. Accomplishment Report
- ☐ 3. No Treatment Recommendation

B. Type of Action

- ☐ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
- ☒ 2. Interim Report # 3.
 - ☐ Updating the initial funding request based on more accurate site data or design analysis
 - ☐ Status of accomplishments to date
- ☐ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Pinal Fire

B. Fire Number: AZ-TNF-000452

C. State:Arizona

D. County: Gila

E. Region:03

F. Forest: Tonto NF

G. District:Globe RD

H. Fire Incident Job Code: P3K0GLI0312

I. Date Fire Started: May 8, 2017

J. Date Fire Contained: 6/15/17 Estimated

K. Suppression Cost: \$9,500,000 to date

L. Fire Suppression Damages Repaired with Suppression Funds

- 1. Fireline waterbarred (miles): 37.5
- 2. Fireline seeded (miles): 37.5
- 3. Other (identify): Safety zones, road damage, hazard trees

M. Watershed Number:

150601030601 (Russell Gulch) – 2.65 mi²
150601030604 (Upper Pinal Creek) – 9.55 mi²

N. Total Acres Burned:

☒ **NFS Acres** 7,850 ☐ **Other Federal** ☐ **State** ☐ **Private**

O. Vegetation Types:

Ponderosa Pine Forest
Mixed Conifer Forest
Madrean Encinal Woodlands
Interior Chaparal

P. Dominant Soils:

Typic Haplustepts,
Lithic Haplustepts
Lithic Haplustalfs
Lithic Haplustolls
Udic Argiustolls
Pachic Argiustolls
Typic Argiudolls

Q. Geologic Types:

Granite
Pinal Schist
Madera Diorite

R. Miles of Stream Channels by Order or Class:

Perennial - 0 miles
Intermittent – 1.6 miles
Ephemeral – 28.7

S. Transportation System

Trails: 14.7 miles **Roads:** 35 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): Unburned (1929) Low (3190) Moderate (2480) High (251)

B. Water-Repellent Soil (acres): 2784

C. Soil Erosion Hazard Rating (acres): (low) (moderate) 7688 (high)

D. Erosion Potential: 3.53 tons/acre

E. Sediment Potential: 297 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 3-5

B. Design Chance of Success, (percent):	90
C. Equivalent Design Recurrence Interval, (years):	50
D. Design Storm Duration, (hours):	1
E. Design Storm Magnitude, (inches):	2.59
F. Design Flow, (cubic feet / second/ square mile):	365
G. Estimated Reduction in Infiltration, (percent):	35%
H. Adjusted Design Flow, (cfs per square mile):	665

PART V - SUMMARY OF ANALYSIS

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

Life and Property; Watersheds on the Forest burned by the Pinal Fire drain to the city of Globe. Residences, businesses, roads, bridges, and other infrastructure within both the county and the city are built within the floodplain of streams draining the burned area. Portions of the watershed have burned with high and moderate burn severity. The probability of damage or loss to life and property is very likely and the magnitude of consequences is major. Users of roads, campgrounds, trails, and other recreation sites are at risk from flash floods derived from burned watersheds. The probability of damage or loss is possible and the magnitude of consequences is major

Soil productivity and hydrologic function:

The soils in the Pinal fire burn area include deep Typic Argiudolls and Pachic Argudolls under the Mixed Conifer in the upper elevations. The middle elevation portions of the burn area are dominated by Ponderosa Pine forest (Udic Argiustolls), Madrean Encinal woodlands (Lithic Haplustolls) that include pockets of interior chaparral (Lithic Haplustepts very shallow) in locations that are drier and have shallower soils. The lowest elevations in the burn area are dominated by interior chaparral (Lithic Haplustepts and Typic Haplustepts) on moderately deep to very shallow soils. Associated soil characteristics that show general trends as you proceed from the upper elevations of the burn area to the lower elevations include soil temp (cooler to hotter), Soil moisture (wetter to drier), thickness of O horizons (thicker to thinner), and thickness of A horizons (thicker to thinner). With the upper elevations having deeper soils, thicker O horizons, and thicker A horizons. These ecosystems have a greater capacity to resist a loss of soil productivity due to erosion than the soils at the lower elevations that are generally shallower, have very thin to no O horizons, and thinner A horizons. For the Pinal fire, combined remote sensing and field observations have shown that Soil Burn Severity was highest in the lower elevations, on soils less resistant to a loss of soil productivity. Using WEPP disturbed and ERMiT models to simulate moderate and high soil burn severity on these less resistant soils, has predicted high levels of erosion and high sediment yields. High erosion on less resistant soils has the potential to pass soil productivity thresholds due to the loss of A horizons, decreasing the overall depth of the soil, and a significant loss of soil organic carbon and soil nutrients. To further aggravate the situation a significant amount Forest Service infrastructure (Roads, Trails, and Camp grounds) and cultural resources (Kellner Civilian Conservation Corps (CCC) campground and Ice House CCC Campground) are located in these lower elevation zones and could be affected by increased erosion and/or increased sediment yields.

The Pinal Fire burned with a mosaic of burn severities in the chaparral portion of the burned area. Soils in this area are composed primarily of decomposed granite. This soil type has very high erosion hazard and is prone to development of water repellent soils due to fire effects. Loss of vegetative cover and development of water repellent soils will result in large increases in runoff and erosion that will deliver ash and sediment to stream channels and result in increases in peak flows. Floatable debris in stream channels can create debris jams that will cause additional increases in peak flows and scour of stream channels when they fail. Increased erosion and runoff from the burned area will reduce soil productivity and adversely affect hydrologic function. Adverse effects to hydrologic function include changes in timing, magnitude, and volume of peak flows and scouring and downcutting of channels. Scouring and downcutting of channels will substantially reduce access to floodplains and concentrate flood flows in a deeper narrower channel that will be prone to bank erosion and

generate additional sediment that would be carried downstream. In addition to impacts on hydrologic function there is a CCC era campground in Kellner Canyon that is at risk from post fire flows and there are three 15-20 foot high CCC dams in Kellner Canyon and at least one in Icehouse Canyon. Damage to these structures from post fire ash, debris, and peak flows is likely. These structures are currently completely silted in and failure could introduce another substantial source of sediment and debris that would aggravate downstream flooding and sediment issues. The probability of damage or loss to soil productivity and hydrologic function is very likely and the magnitude of consequences is moderate.

Roads: The top of the Pinal Mountains is occupied by a large number of communication sites that provide valuable communication services to private businesses and to government agencies (including the Forest Service). Maintaining access to these sites is critically important to all users. The top of the mountains is also occupied by recreational residences, camp grounds, and a fire lookout used by the Tonto NF. The only road to the top of the mountain is FR 651. This road passes along the margin of the burned area for approximately 4.5 miles. Steep slopes above the road have burned with light to high burn severity. A number of culverted crossings pass runoff from the burned area beneath the road and eventually into Russell Gulch. The potential for blockages due to plugged culverts, washouts, and debris is high. FR 651 is accessed by two routes. The first route follows Russell Gulch from Highway 60 in Miami to FR 651. The second route comes up Kellner Canyon to FR 651. The Russell Gulch Road has steep curves that render it unsuitable for semi and tanker trucks delivering supplies and equipment to the mountain top. The Kellner Canyon route is suitable for semi and tanker trucks but crosses a bridge over the canyon that is inadequate for passing projected flood flows from the burned area and is vulnerable to washout. This route is critical for large trucks and is essential to maintain if valuable supplies and equipment are to reach the mountain top. The probability of damage or loss to FR 651 and the Kellner Canyon Road (FR 55) is very likely and the magnitude of consequences is major.

Forest Road 112 provides access to the Pioneer Pass area on the east side of the Pinal Mountains. This road travels up Ice House Canyon and Pinal Creek and provides access to Pioneer Campground and trail heads in the Ice House Canyon and Pioneer Pass areas. Slopes above the road have burned with low to high severity and pose threats to the road from runoff, sediment and debris. The likelihood of damage to this road is very high and the magnitude of consequences is moderate.

Storm Patrol-roads: Repair of road damage following high intensity summer thunderstorms is essential for providing access to the valuable resources on the top of the Pinal Mountains. Storm patrol will consist of cleaning debris from the inlets and outlets of culverts affected by storm water runoff, sediment and debris, and cleaning debris from the road prism.

Trails: There are eight trails that pass through the burned area. Five of the eight provide access from the bottom of the Pinal Mountains to the top and climb through areas of steep slopes. The Sixshooter Canyon Trail (one of the five climbing from the bottom to the top) is a designated National Recreation Trail. These trails pass through a mosaic of burn severities. Slightly more than seven miles of these trails pass through or below areas of moderate to high burn severity. Approximately 13 miles pass through or immediately below burn severities ranging from low to high. Drainage improvements and erosion protection treatments are needed to protect the forests investment in it's trails infrastructure.

Storm patrol-trails: Trails may suffer damage following high intensity summer thunderstorms. To protect investment if forest infrastructure damage should be repaired as quickly as possible. Storm patrol would include debris removal and repair of damaged drainage and erosion control structures.

8/9/2017 A series of storms have impacted the burned area since the BAER treatments were implemented that has damaged the road and BAER treatments on Forest Roads 651 and 112. Forest Road 651 provides critical access to the top of the Pinal Mountains where numerous communication sites, a fire lookout, recreation residences, and Forest Service campgrounds are located.

Weeds: Invasive Weed species were detected in fire camp, along routes providing access to the burned area, and on private lands where fire crews were implementing treatments to reduce risks to structures. Invasive species potentially introduced to the burned area include: Bull thistle (*Cirsium vulgare*), Scotch thistle (*Onopordum acanthium*), Russian knapweed (*Acrotilon repens*), and Tree of Heaven (*Ailanthus altissima*).

Cultural Resources: In addition to the CCC era dams discussed under Soil Productivity and Hydrologic Function a number of other historic and prehistoric sites exist within the burned area that are eligible for listing on the National Register of Historic Places. A number of these sites are vulnerable to post fire runoff and erosion and have a high to very high risk rating based on likelihood of damage and magnitude of consequences. Four sites were identified for stabilization.

B. Emergency Treatment Objectives (narrative):

- To protect soil productivity and hydrologic function by minimizing accelerated erosion and runoff from burned watersheds
- To reduce the magnitude of increased peak flows
- To minimize downcutting and bank erosion of fire impacted stream channels
- To minimize damage to FR 651 and the Kellner Canyon Road and to keep these roads passable for supplies and equipment delivered to mountaintop communications sites, for residents of recreational residences, and for access to the Signal Peak Lookout.
- To minimize damage to trails passing through the burned area.
- To minimize possibility that invasive species will be introduced into the burned area
- To rapidly make roads passable (particularly FR 651 that provides access to resources on top of the Pinal Mountains) for use following storms.
- Implement erosion control work, including strategic mulching and wattles where effective for protection of critical cultural resources.

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

Land 90% Channel 95% Roads/Trails 90% roads 75% trails Protection/Safety 90%

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	50	75	90
Channel	75	50	50
Roads/Trails	50	75	90
Protection/Safety	80	80	80

E. Cost of No-Action (Including Loss): \$4,847,000

F. Cost of Selected Alternative (Including Loss): \$3,053,000

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input checked="" type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range
<input type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input checked="" type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS

Team Leader: Grant Loomis

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H. Treatment Narrative:

(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

Land Treatments: Mulch areas of moderate and high burn severity on chaparral watersheds. Approximately 1190 acres would be treated.

Channel Treatments:

- remove floatable debris from stream channels that flow towards private lands below the burned area. Approximately 10 miles would be treated.
- Using the Forest Service Wyden Amendment authority contribute to the cost of removing debris from channels downstream from NFS lands so that critical access to the resources on the top of the Pinal Mountains can be maintained.

Roads and Trail Treatments:

Roads: clean ditches and culverts, remove floatable debris for approximately 250 yards from channels above culverts. Replace eight culverts that are either nonfunctional or undersized.

Trails: Emergency erosion control work, drains, grade dips, water bars. Strategic mulching and wattles where effective. Hazard trees that threaten the safety of crews implementing trail protection treatments will be removed.

Invasive Species: Detection and removal will be conducted in areas where invasive species may have been introduced to the burned area. Focus areas will include roads and trails used by suppression equipment and crews, areas disturbed during the suppression effort (safety zones, spike camps, helispots, etc) and riparian areas upstream of Tree of Heaven infestations on adjacent private lands and adjacent to areas disturbed by suppression efforts.

Cultural Resources: Some sites are in locations that would be mulched as part of the general watershed treatment implemented to reduce runoff and erosion. Other sites are along trails and can be treated at the same time that trail stabilization work is implemented. Other sites will require site specific treatments that can be installed by crews installing trail stabilization treatments. These treatments can be implemented based on cost savings from the mulching contract

Four sites have been identified for stabilization. The work will be done by the ACC crews estimating at most about \$14,000 for protecting cultural resource sites. The work can be done while the crews are implementing the trail treatments.

Protection/Safety Treatments: Fill remnants of vault from toilet at Pioneer Pass campground. Place warning signs on roads and trails entering burned area to warn users of hazards from the burned area. Remove hazard trees from roads, recreation sites, communication sites, recreation residences, and Signal Peak Lookout.

I. Monitoring Narrative:

(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #

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										
Mulch	acres	600	1125	\$675,000	\$0		\$0		\$0	\$675,000
Mulch Cost savings	job			-\$225,000						
Weed dtctn and rmvl	mi	400	64	\$25,600	\$0		\$0		\$0	\$25,600
Implementation Team	days	2200	20	\$44,000	\$0		\$0		\$0	\$44,000
Cultural site stabilization	site	3600	4	\$14,400						
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$534,000	\$0		\$0		\$0	\$744,600
B. Channel Treatments										
rmve floatable debris	mi	10,500	10	\$105,000	\$0		\$0		\$0	\$105,000
Wydn Athrty Dbrs Rmvl	mi	10000	10	\$100,000	\$0		\$0		\$0	\$100,000
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treat.				\$205,000	\$0		\$0		\$0	\$205,000
C. Road and Trails										
Imprv rd drainage	mi	2000	17	\$34,000	\$0		\$0		\$0	\$34,000
upgrade culverts	ea	580	9	\$5,220			\$0		\$0	\$5,220
Trail treatments	mi	7000	13	\$91,000	\$0		\$0		\$0	\$91,000
Storm Patrol -Roads	ea	6000	3	\$18,000	\$0		\$0		\$0	\$18,000
Add'l storm patrol	ea	6000	8.3333	\$50,000						
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Road & Trails				\$198,220	\$0		\$0		\$0	\$148,220
D. Protection/Safety										
vault cleanout	ea	2000	1	\$2,000	\$0		\$0		\$0	\$2,000
Warning signs	ea	300	18	\$5,400	\$0		\$0		\$0	\$5,400
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Structures				\$7,400	\$0		\$0		\$0	\$7,400
E. BAER Evaluation	ea	\$54,130	1		\$54,130					
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				---	\$0		\$0		\$0	\$0
F. Monitoring										
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals				\$944,620	\$0		\$0		\$0	\$1,105,220
Previously approved				\$1,105,220						
Total for this request				\$0						

PART VII - APPROVALS

1. _____
Forest Supervisor (signature) _____
Date
2. _____
Regional Forester (signature) _____
Date