USDA-FOREST SERVICE FS-2500-8 (6/06)

Date of Report: 10-27-2011

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[X] 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)

[X] 2. Interim Report # 1
[X] 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: Tanner

B. Fire Number: AZ-TNF-109

C. State: Arizona

D. County: Gila

E. Region: 3

F. Forest: Tonto

G. District: Pleasant Valley, Tonto Basin

H. Fire Incident Job Code: P3GBY5

I. Date Fire Started: 8/20/2011

J. Date Fire Contained: 10/12/2011

K. Suppression Cost: $2.8 million

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles):0
2. Fireline seeded (miles): 0
3. Other (identify):

M. Watershed Number: 1506010308

N. Total Acres Burned: 5,456
NFS Acres(5,456) Other Federal ( ) State ( ) Private ( )

O. Vegetation Types: Mixed Conifer, Ponderosa Pine, Chaparral, Riparian

P. Dominant Soils: Typic Argiudolls, Udic Paleustalfs, Lithic Haplustalfs, Udertic Haplustalfs.

Q. Geologic Types: Diabase, Dripping Springs Quartzite, Troy Quartzite, Mescal Limestone.

R. Miles of Stream Channels by Order or Class:
Perennial – 2.4 miles
Intermittent and Ephemeral – 14.5 miles

S. Transportation System

Trails: 0 miles Roads: 6.8 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 1874 (low) 1222 (moderate) 736 (high)

B. Water-Repellent Soil (acres): 1347

C. Soil Erosion Hazard Rating (acres):
493 (low) 2836 (moderate) 2127 (high)

D. Erosion Potential: 13 tons/acre for two years.

E. Sediment Potential: 4,200 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 80

C. Equivalent Design Recurrence Interval, (years): 25

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 2.5

F. Design Flow, (cubic feet / second/ square mile): 375

G. Estimated Reduction in Infiltration, (percent): 25

H. Adjusted Design Flow, (cfs per square mile): 725

PART V - SUMMARY OF ANALYSIS

I. Describe Critical Values/Resources and Threats:

Human Life and Safety

Rose Creek private lands
Private lands exist along Rose Creek downstream of the Rose Creek Campground. Homes and facilities associated with the homes are potentially located within the floodplain of Rose Creek. Approximately 35 percent of the watershed burned with moderate to high burn severity. The threat of flooding on these lands has increased substantially. Modeled peak flow increases have more than

doubled for most one hour storm events at the Rose Creek Campground just upstream of the private lands. The Table below displays the peak flow increases anticipated at the campground.

Peak Flows at Rose Creek Campground

Flood Recurrence Interval (yr)	PreFire (cfs)	PostFire (cfs)
2	75	280
5	220	690
10	400	1075
25	735	1700
50	1050	2210
100	1400	2770

Sawmill Flat Campground – This campground is located at the base of steep slopes that have burned with low to high severity. There is a threat of flash floods, ash flows, and rolling rocks to users of this campground.

Rose Creek Campground – This campground is located in the floodplain of Rose Creek just downstream of the burned area. The majority of the Rose Creek watershed above the campground burned, 50 percent with moderate to high severity. There is a likely threat of flash floods and flood borne debris that represent a threat to the life and safety of users of the campground. The only exit from the campground crosses Rose Creek and may not be crossable during flood events.

Private Lands at Workman Creek
Private lands with structures exist on Workman Creek downstream of the confluence with Rose Creek. One parcel contains two seasonally occupied mobile homes that exist within the floodplain of Workman Creek and may be at risk of flooding. A cross section completed at this site following the Coon Creek Fire of 2000 found the structures to be within the 2-5 year prefire floodplain.

Natural Resources

Soil Productivity and Hydrologic Function

Areas of high and moderate burn severity have impacted soil productivity by removing vegetative ground cover, the organic matter within the topsoil and on the forest floor, and to a lesser extent by creating water repellent conditions within the soils themselves. Consumption of the organic layer on the forest floor and severe heating of the upper layer of soil has degraded the seed bank stored in the soil. The most important soil physical characteristic that affects soil hydrologic function and soil stability is soil structure. The organic matter component, which provides for loose, granular structure, can be lost at relatively low temperatures. The loss of soil structure increases the bulk density of the soil and reduces its porosity, thereby reducing infiltration and soil productivity and making the soil more vulnerable to post-fire runoff and erosion. Removal of the protective vegetative and organic layers combined with loss of soil structure and increased water repellency also increases erosion. Soil loss occurs through surface, rill, and gully erosion processes. Loss of the soil seed bank, loss of soil structure, and soil loss through erosion processes retards vegetative recovery which, in turn, further impairs soil productivity and watershed conditions.

Hydrologic function within moderately and severely burned areas has also been impacted by loss of the vegetative canopy that intercepts some rainfall, by loss of the organic layer on the forest floor that absorbs some rainfall, by loss of soil structure which reduces infiltration and to a lesser extent by development of water repellent soils which also reduces infiltration. Reduced interception and absorption, and reduced infiltration increase runoff from a given rainfall event. Increased runoff

increases erosion and the magnitude of peak flows expected from a watershed. The Increased magnitude of peak flows represents an increased flood threat to downstream life and property. Increases in erosion can occur on both uplands and in channels. Rills and gullies can form in uplands and channels can scour and downcut. Sediment delivered to channels from rill and gully erosion and eroded from channel banks during scouring and incision processes can deposit in areas of lower energy. Sediment, bedload, and debris deposits can plug culverts and bridges, deposit on floodplains, terraces and other low lying areas such as agricultural fields, can clog ditches and water supply intakes and generally adversely affect infrastructure in downstream areas.

Downcutting of stream channels can lower water tables in adjacent floodplain aquifers and result in drying of meadows and mortality of riparian vegetation. Downcutting of stream channels also separates the stream from its floodplain, alters the sediment transport characteristics of the channel, and causes erosion of the channel banks until the channel has widened sufficiently to permit development of a new floodplain at the lowered base level of the channel. The downcutting, widening and depositing processes can destabilize affected channels for many years.

Increases in runoff and erosion, changes in sediment transport characteristics, impacts to channels and floodplains, and impacts to water quality from ash, sediment, and temperature effects, combine to impair hydrologic function.

Impaired soil productivity and hydrologic function affect:

- Human life and safety on or in close proximity to burned NFS lands through increased flood threats,
- Property and infrastructure on or in close proximity to burned NFS lands through increased flooding, erosion, and debris threats,

Invasive Species

Engines and Dozers were brought in to suppress this fire. Approximately four miles of road was reopened with a dozer to serve as a fire containment line. Weeds may have been introduced to the burned area through ground disturbing activities

Property

Roads

Highway 288 Conner Canyon – The mainstem of Conner Canyon flows along the edge of Highway 288 until it crosses beneath the highway in a 30 inch culvert. The channel and highway are confined to a narrow passage between the adjacent hillslopes (see photo below).

The channel has been bermed with a small rock and soil berm along part of its length to keep flows in the channel off the highway. ADOT stated that even with the berm they have to remove debris from the roadway following larger storms. Most of the watershed above the culverted crossing has burned with moderate to high intensity (71%) and peak flows will increase dramatically. The table below displays the modeled changes in peak flows for the one hour storm. The storm that would have produced the 2 year flood under prefire conditions now results in a flow greater than the prefire 100 year flood.

Conner Canyon Peak Flows

Storm Recurrence Interval (yr)	Pre-Fire (cfs)	Post Fire (cfs)
2	5	140
5	20	240
10	35	325
25	70	445
50	95	540
100	125	635

Flooding and debris are expected to impact the highway under post fire conditions. This highway is the most direct route from Young to the Roosevelt Lake area and Globe.

Highway 288 – Rose Creek watershed culverts
Three culverted crossings of highway 288 occur in the Rose Creek watershed. The watersheds above these culverts burned with 37, 55, and 41 percent moderate to high burn severity respectively. Peak flows above these culverts are also expected to increase substantially and represent a threat to the highway in terms of flooding and debris.

Highway 288 – Workman Creek watershed.
Slopes above Highway 288 have burned with moderate to high burn severity at two locations along the portion of the highway that drops down to Workman Creek. Increases in runoff and debris that threaten the highway are expected from these slopes.

Threats to roads may also represent a threat to human life if vehicles are passing through the area during rainfall runoff events.

Cultural and Heritage Resources

Parker Creek Rocky Mountain Forest and Range Experiment Station Headquarters
The confluence of an unnamed tributary to the mainstem of Parker Creek occurs just above the culvert beneath the road that provides access to the former headquarters of the Sierra Ancha experiment station. Approximately fifty percent of the watershed burned with moderate to high severity. The watershed is steep and floodflows and debris may threaten the old power building that provided power to the residences and offices at the headquarters site. This structure is located immediately adjacent to the channel of the unnamed tributary and appears to be at risk. The entire headquarters compound including the power building is eligible for inclusion in the National Register of Historic Places.

B. Emergency Treatment Objectives:

Reduce the risk of flooding on private lands below the burned area
Reduce the risk of flooding to campgrounds within and below the burned area
Reduce the risk of flooding and debris on Highway 288 through the burned area

Reduce the risk of flooding at the Sierra Ancha Experiment Station Headquarters on Parker Creek
Reduce loss of soil productivity and hydrologic function on severely and moderately burned areas withithin the burn perimeter
Detect and remove noxious weeds introduced into the burned area.
Warn users of Highway 288 and campgrounds about the risk of flash floods through the use of warning signs.

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

Land **80** % Channel **80** % Roads/Trails ___ % Protection/Safety **90** %

D. Probability of Treatment Success

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

E. Cost of No-Action (Including Loss): $3,546,400

F. Cost of Selected Alternative (Including Loss): $2,602,780

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology	[X] Soils	[ ] Geology	[ ] Range	[X] Weeds
[ ] Forestry	[X] Wildlife	[X] Fire Mgmt.	[ ] Engineering	[ ]
[ ] Contracting	[ ] Ecology	[ ] Botany	[X] Archaeology	[ ]
[X] Fisheries	[ ] Research	[ ] Landscape Arch	[ ] 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:

Seed 1567 acres of areas burned with high and moderate burn severity above the private lands at Rose Creek, Highway 288, and the campgrounds at Sawmill Flat and Rose Creek.

Seed and mulch 110 acres of high burn severity areas above Highway 288 in the Connor Canyon Area and along the portion of Highway 288 that drops down to Workman Creek.
Detect and remove noxious weeds from areas where dozers were used to create fire lines.

Channel Treatments:
Remove floatable debris from the channel and floodplains upstream of culverted crossings of Highway 288 for a distance of 300 yards.

Roads and Trail Treatments:

Protection/Safety Treatments:
Install four hazard warning signs: two on Highway 288 where the highway enters the burned area from the north and south, and two at entrances to the Sawmill Flat and Rose Creek Campgrounds.

Recommend that the Sawmill Flat and Rose Creek Campgrounds be converted to day use only for a minimum of two years following the fire. Watershed condition will be inspected after the second year to determine whether unsafe conditions continue to exist.

Recommend that ADOT implement flood patrols during storm events for at least one year following the fire.

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 #**

			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										
Aerial Seeding	acre	66	1677	$110,682	$0		$0		$0	$110,682
Aerial Mulch 1T/ac	acre	760	110	$83,600	$0		$0		$0	$83,600
Weed Dtctn & rmvl	mile	625	4	$2,500	$0		$0		$0	$2,500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$196,782	$0		$0		$0	$196,782
B. Channel Treatments										
debris removal	mile	5000	2	$10,000	$0		$0		$0	$10,000
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$10,000	$0		$0		$0	$10,000
C. Road and Trails										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$0	$0		$0		$0	$0
D. Protection/Safety										
Hazard signs	ea	500	4	$2,000	$0		$0		$0	$2,000
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$2,000	$0		$0		$0	$2,000
E. BAER Evaluation										
Assessment	ea	7500	1	---	$7,500		$0		$0	$7,500
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$7,500		$0		$0	$7,500
F. Monitoring										
				$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				$208,782	$7,500		**$0**		**$0**	**$216,282**
Previously approved										
Total for this request				**$208,782**						

Contracting costs for seeding and mulching are higher than estimated in the initial assessment. This interim request reflects the cost of bids received for these contracts.

PART VII - APPROVALS

1. **/s/ Gene Blankenbaker** 12/1/11
   Forest Supervisor (signature) Date

2. /s/ Gilbert Zepeda (for) 12/6/2011
   Regional Forester (signature) Date