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

Date of Report: 7/14/2014

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

[X] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

[ ] 2. Interim Report #____
[ ] 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: Oak Fire

B. Fire Number: AZ-CNF-000670

C. State: AZ

D. County: Graham

E. Region: 03

F. Forest: Coronado NF

G. District: Safford

H. Fire Incident Job Code: P3H56L

I. Date Fire Started: 6/17/14

J. Date Fire Contained: Ongoing

K. Suppression Cost: $3,237,000 (as of 7/7/14)

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 2 miles waterbarred
2. Fireline seeded (miles): -
3. Other (identify): 5 acres of spike camp, scarified and reseeded

M. Watershed Number: 150502030408 Rattlesnake Creek; 150502030406 Oak Creek, 150502030403 Paddy's River, 150502030407 Kennedy Falls Wash-Aravaipa Creek

N. Total Acres Burned: approximate
NFS Acres(13,036) Other Federal ( ) State (4) Private ( )

O. Vegetation Types: Oak, juniper, pinyon mix; Upper pine-oak; Desert and semi-desert shrub;Chaparral

P. Dominant Soils: Lithic Ustochrepts,Typic Ustochrepts, Aridic Ustochrepts, with major component of rock outcrop

Q. Geologic Types: Rhyolitic Tuffs, Andesite

R. Miles of Stream Channels by Order or Class: Perennial: 0, Intermittent: 53.3, Ephemeral: 0

S. Transportation System

Trails: 19.49 miles Roads: 1.16 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 1,512(Unburned/Very Low) 8,694 (low) 2,513 (moderate) 321(high)

B. Water-Repellent Soil (acres): 321

C. Soil Erosion Hazard Rating (acres):
0 (low) 11,372 (moderate) 1,667 (high)

D. Erosion Potential: 6.4 tons/acre

E. Sediment Potential: 534 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 85

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

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 2.20

F. Design Flow, (cubic feet / second/ square mile): 366

G. Estimated Reduction in Infiltration, (percent): 35

H. Adjusted Design Flow, (cfs per square mile): 221

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The Oak Fire burned in the Galiuro Mountains in eastern Arizona on the Safford Ranger District approximately 34 miles northwest of Wilcox, AZ. The fire was caused by lightning near Oak Canyon/China Peak area and started on June 17th. Elevation ranges from 5,000 feet to just over 7,300 feet within the burn area. Vegetation ranges from semi-desert grassland at the lower elevations to Pine-Oak Forest with a minor component of mixed conifer at the higher elevations. The higher intenisty burn areas were comprised of Pine with a heavy oak and manzanita understory. The moderate intensity burn areas were largley comprised of pinyon-juniper woodland with a high denisty of manzanita and oak in the understory. Approximately 8,900 acres burned within the wilderness area and approximately 4,100 acres burned outside of the wilderness boundary.

The fire was managed as a fire use fire for resource benefit. Objectives included: containing fire activity within the defined planning area south and west of private and state lands, east of Rattlesnake Canyon and north of High Creek, improve wildlife habitat and forage, improve rangeland and watershed conditions, improve forest health, protection of historic structures, and minimize fire severity impacts to threatened and endangered species. See the Biological Assessment for Rockhouse prescribed fire treatment and Galiuro firescape document for more information.

A burned area reflectance classification (BARC) map was provided on 7/1/14 and verified by 2 helicopter flights, one on 7/7/14 and one on 7/9/14. Due to the remoteness, steep slopes, and onset of the southwestern monsoon season ground field verification was minimal. Field verification which included soil burn severity data collection occurred along the trail leading from Deer Creek Cabin to Kennedy Peak and was conducted on 7/8/14. The soil burn severity map was finalized on 7/10/14. 1,280 acres of the burn area was not part of the initial satelite imagery and was mapped visually by helicopter and digitized. A small area, 285 acres, in the North Fork of Douglas canyon was classified as unchanged by the BARC map, but was observed to include a mosaic of moderate and low burn intensities. After flying the fire, but being unable to conduct field assessments in this area due to remoteness and onset of monsoonal rains it was determined to leave this reflectance classification as is due to the mosaic burn of mostly low intensities with patches of moderate burn intermingled that would otherwise be too difficult to accurately map.

Critical Values Identified

Critical Values identified (FSM 2523.1 Exhibit 01) during the BAER assessment are: Human life and safety, property, natural resources and cultural/heritage resources. The BAER team evaluated the risk to those critical values using the BAER Risk Assessment (FSM 23235.1 Exhibit 02).

The following risk matrix shown below, Exhibit 2 of Interim Directive No.: **2500-2010-1**, was used to evaluate the Risk Level for each value at risk identified during Assessment:

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	Loss of life or injury to humans; substantial property damage; irreversible damage to critical natural or cultural resources.	Injury or illness to humans; moderate property damage; damage to critical natural or cultural resources resulting in considerable or long term effects.	Property damage is limited in economic value and/or to few investments; damage to natural or cultural resources resulting in minimal, recoverable or localized effects.
	RISK		
Very Likely (>90%)	**Very High**	**Very High**	**Low**
Likely (>50% to <90%)	**Very High**	**High**	**Low**
Possible (>10% to <50%	**High**	**Intermediate**	**Low**
Unlikely (<10%)	**Intermediate**	**Low**	**Very Low**

The Very High and High Risk are unacceptable risk levels due to threats to human life, property, infrastructure and resources, therefore treatments should be applied. An Intermediate Risk could be unacceptable if human life or safety is the critical value at risk.

A full list of values at risk that were analyzed during the assessment can be found in Appendix A

Human Life and Saftey

There are minimal post fire risks to life and safety as a result of the Oak Fire. Individuals who may find themselves on any of the Forest trails within the burn area that follow drainage bottoms including, but not limited too the Sycamore, Tortilla, Corral Canyon, and Rattle Snake Canyon trails during high intensity rain events could be at risk. Risks of being stranded or injured during and after rain events due to debris flows and washouts are possible.

One private residence (Deer Creek Ranch) is located just outside of the eastern edge of the burn area perimeter. This resident sits up and out of the drainageway. The majority of soil burn severity above this residence is low and very low with moderate soil burn severity intermingled throughout. Deer Creek Ranch, people and property, are at a very low risk from post fire effects.

Infrastucture

Forest Trails are the main infrastructure that would be most impacted by fire effects, East Divide trail between Corral Canyon Trail junction and the Deer Creek Administrative site would be the highest priority for mitigation based on percent of grade, remaining vegetation above and below trail corridor and location of trail tread on slope. Fire Crew Four from the Safford District has begun installation of water bars on East Divide trail where it begins to climb from the canyon bottom, where several short stretches run with the fall line and through the area that is most devoid of vegetation. Crew Four will continue with water bar installation to the tree line near the crest of the ridge.

Corral Canyon Trail was also heavily impacted by the fire as most of the upper portion of the canyon received moderate to extreme fire behavior. The upper most portion of this trail runs along the ridge top and will receive minimal soil/watershed impacts. As the trail descends into the canyon, many grade reversals and switchbacks were designed into initial trail construction and will help to mitigate seasonal watershed impacts.
East Divide Trail as it crosses Douglas Canyon is an area of minor concern. The upper portion of this canyon had low intensity fire and is still heavily vegetated. Minimal watershed management and soil conservation concerns are present.

Forest Roads 253, 253A, 253B, 253C, 253D, and 253E are at low risk to damage. The majority of soil burn severity above these roads consists of low with a limited amount of moderate soil burn severity higher in the watershed.

Deer Creek administration site is located in the north eastern portion of the burn area just outside of the wilderness boundary. There is low and very low soil burn severity above this structure. This administration site is at very low risk of post fire damage.

Historical buildings are described below.

Natural Resources

Soils

The general ecosystem survey (GES) was used to compile soil information. Field observations indicate that the majority of the soils in the burn area consist of very shallow to shallow soils. Some of the higher elevation soils, which contribute to a very small percentage of the burn area consist of deep soils. Rock outcrop in the burn area makes up a major portion of the land area. There is a risk of accelerated soil erosion and sediment production predicted within the Oak Fire burn area, particularly from the high and moderate soil burn severity. The high and moderate soil burn severity contributes to approximately 2% and 19% respectively. Modeling shows that erosion rates will increase from pre-fire levels of just over 0 tons per acre to post fire levels of just over 34 tons per acre in the high soil burn severity areas. Pre-fire levels of just over 0 tons per acre to post fire levels of just over 24 tons per acre were modeled in moderate soil burn severity areas. Soil tolerance values on these types of soils are usually very low, in the range of 2-4 tons per acre. The modeled soil erosion rates in the high and moderate burn areas greatly surpass the estimated tolerance values. The nature of the geology in this area, mainly rhyolitic tuffs, and the very shallow and shallow soils all contribute to these areas becoming very unstable and are a main concern to loss of soil productivity. Once vegetative overstory and ground cover are removed these areas are likely to become very active and unstable losing site productivity in the process. The majority of the burn area is affected by low soil burn severity, but due to the inherent unstable nature and shallow soils, soil productivity may still be negatively affected in the low soil burn severity areas of the burn area. High and moderate soil burn severity areas are at a very high risk to loss of soil productivity.

Hydrologic Function

The high intensity short duration precipitation events that coincide with the southwestern monsoon season along with the spotty nature of vegetation, large amount of rock outcrop, and shallow soils that existed pre-fire contributed to a “flashy” hydrologic response prior to this area burning. Hydrologic function will be further reduced due to loss of vegetative overstory, vegetative ground cover, and the litter layer in the high and moderate soil burn severity areas post fire. In a functioning watershed these layers intercept and slow raindrop impact, absorb and slow overland flow, and provide a natural resistance to excessive erosion. In the moderate soil burn severity areas negative effects to hydrologic function are anticipated, but needle casts remaining on trees and incomplete consumption of the litter layer will help to reduce these effects. Steep long slopes will further add to the loss of control of water, there is a risk to downstream sedimentation and loss of site productivity. Oak and manzanita, which regenerate relatively quickly post-fire, made up a large majority of the understory within the burn area. These fire adapted species will assist in stabilizing hydrologic function relatively quickly. Recovery of watershed condition and hydrologic function in this system can take 3-5 years to stabilize.

WILDCAT 5 was used to model pre and post-fire rainfall runoff. Post-fire flows from a 25 year 1 hour precipitation event modeled at corral canyon and horse canyon are expected to increase 60% which is the largest modeled increase within the burn area.

Water Quality
Effects to water quality will be minimal and localized. Ash and sediment are expected, but due to the low amount of high and moderate soil burn severity in these watersheds, water quality is considered to be at low risk from fire effects.

Cultural Resources

There is one historical site, Power Gardens, located on the western burn area perimeter. This area contains 4 structures and 2 corrals. These structures mainly sit up and out of the channel a good distance away from where flow would be concentrated. Due to the minimal amount of high and moderate soil burn severity in the upper watersheds and WILDCAT 5 modeling results, these historic structures are at a very low risk of post fire damage. Other cultural sites within and surrounding the burn area are not of concern from post fire damages.

Critical Habitat

Chiricahua Leopard Frog and Critical Habitat
This habitat and species includes lentic and lotic systems in desert areas up to oak and pine-oak vegetation communities. Leopard frogs currently occupy several stock and mining tanks just off-Forest in the Deer Creek drainage, as well as portions of Deer Creek itself. They are also found in small pools within the Oak Creek drainage nearby. The majority of the 6th code watershed that supports these frogs burned at low intensities or remained unburned; the amount of ash remaining in the area is light, and ash/sediment movement is not expected to affect leopard frogs or their habitats. This critical habitat is at a low risk from negative post fire effects.

Mexican Spotted Owl Critical Habitat
Due to the nature of the burn pattern found within the Oak Fire the mosaic qualities of the remaining habitat still meet the descriptions of critical habitat for the Mexican spotted owl. While distributions of vegetation may have changed slightly, the overall quality of the habitat will be improved as a result of what was primarily an understory burn. Riparian areas are considered to have burned at low intensity, which will stimulate regeneration of grasses and understory plants, providing increased seed sources for small mammalian prey for the owls. Areas of moderate fire severity will provide replacement snags in the future, a resource that was not lacking prior to the fire due to historical drought conditions. This critical habitat is at a very low risk from negative post fire effects.

B. Emergency Treatment Objectives:

1. Post warning signs at trailheads entering the burn area to warn the public of hazardous conditions. The forest has existing signs from past incidents that will be posted by trailheads entering the burn area.

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

Land __-__ Channel __-__ Roads/Trails __-__ Protection/Safety _-_

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land			

Channel			
Roads/Trails			
Protection/Safety			

E. Cost of No-Action (Including Loss):

F. Cost of Selected Alternative (Including Loss): $1,500.00

G. Skills Represented on Burned-Area Survey Team:

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

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H. **Treatment Narrative:**

Protection/Safety Treatments:
Install hazard warning signs at key entry points around the burn area. Signs are available from past incidents and these will be posted by trailheads entering the burn area by forest personnel. No funds will be requested for this treatment.

Noxious Weed Detection
Field site visits for the detection of invasive noxious weed species will take place post monsoon season and again in the spring. Detection surveys would occur along roads, staging areas, ICP, and safety zones. If noxious weeds are detected, they will be treated on site or an interim request will be submitted for treatment depending on the size and population of noxious weed species. Current request is based on GS 11 for 4, 8 hour days plus mileage.

Part VI – Emergency Stabilization Treatments and Source of Funds

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			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										
Noxious Weed	days	375	4	$1,500	$0		$0		$0	$1,500
				$0	$0		$0		$0	$0
Subtotal Land Treatments				$1,500	$0		$0		$0	$1,500
B. Channel Treatments										
				$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 Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
				$0	$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/Closure signs	per			$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
				$0						
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$0	$0		$0		$0	$0
E. BAER Evaluation										$12,000
				---			$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$0		$0		$0	$0
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				$1,500	$0		**$0**		**$0**	**$1,500**
Previously approved										
Total for this request				**$1,500**						

PART VII - APPROVALS

1. Jim Upchurch — 7/14/2014
   Forest Supervisor (signature) — Date

2. /s/ Jeanne M. Higgins (*for*) — 7/22/2014
   Regional Forester (signature) — Date