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

Date of Report: 5/25/2014
Revised 5/29/2014

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: Signal Fire

B. Fire Number: NM-GNF-000155

C. State: NM

D. County: Grant

E. Region: 03

F. Forest: Gila NF

G. District: Silver City

H. Fire Incident Job Code: P3H4DV (0306)

I. Date Fire Started: 5/11/2014

J. Date Fire Contained: 5/23/2014

K. Suppression Cost: $6,900,000

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 19.2
2. Fireline seeded (miles): ongoing at this time
3. Other (identify):NA

M. Watershed Number: 6th code HUC #'s #150400010802, #150400010803, #150400020101

N. Total Acres Burned: 5,546(based on 05/15 2141 hrs IR perimeter) (5484 acres determined at a later date; BAER team used the initial acreage of 5740 for assessment)
NFS Acres(~~5,740~~ 5484) Other Federal ( ) State ( ) Private ( )

O. Vegetation Types: Mixed Conifer, Pine, Pinyon/Juniper

P. Dominant Soils: Mollisols and Inceptisols

Q. Geologic Types: Basalt, Rhyolite, Andesite

R. Miles of Stream Channels by Order or Class: Perennial: 0.70, Intermittent: 1.69, Ephemeral: 20.80

S. Transportation System

Trails: 8.35 miles Roads: Maint. Level 3: 6.39, Maint. Level 2: 12.84, Maint. Level 1: 0.61 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 3,581 (62%) (low) 697 (12%) (moderate) 1,244 (22%) (high)

B. Water-Repellent Soil (acres): 1765

C. Soil Erosion Hazard Rating (acres):
17 (low) 1,200 (moderate) 4,303 (high)

D. Erosion Potential: 8.4 tons/acre

E. Sediment Potential: 484 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 75

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

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 1.9

F. Design Flow, (cubic feet / second/ square mile): 392

G. Estimated Reduction in Infiltration, (percent): 86

H. Adjusted Design Flow, (cfs per square mile): 1868

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The Signal Fire is located in the Pinos Altos Mountain Range on Signal Peak approximately 10 miles north of Silver City. The fire was human caused and was started the afternoon of May 11th. There was a Red Flag warning that day with sustained winds of 40 mph and gusts up to 50 mph. The ignition point was along the Signal Peak road which is a Forest Service road used to access a Forest Service lookout tower, a Forest communications site and private residences. The fire was a stand replacement event of the mixed conifer on the north slope of Signal Peak. The majority of the high and moderate burn severity (1,941 acres) within the fire occurred the afternoon and evening of May 11th.

Threats to public safety exist as a result of the fire. Critical Forest values at risk as a result of the fire include loss or damage to the Lockney Road (FR 855 A) which provides the only access to a private inholding with year round residents, the Signal Peak Road (FR 154) providing access to Signal Peak Lookout and Forest Service communications repeater, portions of the Continental Divide National Scenic Trail, and a NRCS Snotel Site. Soil productivity and watershed function are at great risk of experiencing negative effects due to loss of vegetative canopy, vegetative ground cover and the duff layer which will contribute to an increase in erosion and sedimentation rates.

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:

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.

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**

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 post fire risks to life and safety as a result of the Signal Fire. Individuals who may find themselves on Forest roads 154, 855A or that portion of 149 that is located in the bottom of Meadow Creek are at risk from post fire flows and run the risk of being stranded during and after rain events due to road failures, debris flows and washouts. Residents who live in the private inholding on Forest road 855A run the risk of being stranded with no way out after rain events due to road failures and washouts. There are no other roads that access the private inholding other than 855A. The portion of FR 149 that is located in the bottom of Meadow Creek leads to a large dispearsed camping area that is highly utilized and could lead to an increased threat to loss of life, limb and property.

Infrastucture
There is very high risk of substantial damage to Forerst Service road systems due to post fire conditions. These roads serve as access to private residences, the Signal Peak Lookout tower, the Black Peak communication site and a NRCS Snotel site. Sections of FR 154 and 855A are located in the high severity burn or directly downslope of it. These roads are expected to be heavily impacted by extreme flows and excessive sedimentation. Potential loss of portions of these roads are anticipated if they are not preped prior to the monsoon season.

Natural Resources

Soils
There is a very high risk of accelerated soil erosion and sediment production predicted within the Signal Fire burned area, particularily in the high burn severity. Modeling shows that erosion will increase from pre-fire levels of just over 0 tons per acre to post fire levels of over 40 tons per acre. Of the 5,484 total acres within the burned area, 4,303 acres have a soil erosion hazard rating of severe. The initiation of new surface erosion sources from the very steep slopes pose an extreme threat to long-term soil productivity.

Hydrologic Function
Hydrologic function will be greatly reduced due to loss of vegetative overstory, vegetative ground cover, and the duff layer. The loss of these layers in the ecosystem has profound negative effects to hydrologic function. In a functioning watershed these layers intercept and slow raindrop impact, absorb and slow overland flow, and provide a natural resistance to excessive erosion. Recovery of watershed condition and hydrologic function can take up to 20 years to stabilize.

B. Emergency Treatment Objectives:

1. Place closure gates and post warning signs at key access points of the burn area to warn and prevent the public from entering the burned area. Signs will be posted by roads and trailheads. A closure gate will be installed on FR 154 to keep the public from entering the high severity burned area of the fire. A closure gate will be installed on FR 149 to keep people out of popular dispersed camping site along Meadow Creek. This area is expected to experience debris flows.
2. Seed with certified weed free seed, approximately 1,250 acres of high burn severity and 275 acres of moderate burn severity that is intermingled within the seeding pologon. This is to provide for relatively

quick establishment of vegetative ground cover to assist the burned area in maintaining soil productivity. This treatment will also assist in reducing the amount of erosion and loss of control of water that the burned area will experience which should reduce the negative impacts to the Forest Service road system.

3. Prep Forest roads 154 and 855A with additional drainage to prevent road failure due to excessive flows and sedimentation from post fire rain events. Clean culverts, lead out ditches and add additional drainage features such as rolling dips to minumize post fire effects to the roads. Six low water crossings will be installed to accommodate post fire flows. Treatments are intended to prevent road failure and keep the roads passable for residents who live within the private inholding on FR 855A and to keep FR154 passable to maintain acess to the private inholding, lookout tower and forest communication site.
4. Mitigate damage and reduce excessive erosion to the Continetal Divide National Scenic trail by installing additional drainage to areas of the trail that are susceptible to erosion due to post fire conditions.

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

Land **90**% Channel **90** % Roads/Trails **90**% Protection/Safety **100**

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	90	95
Channel	85	85	95
Roads/Trails	65	80	85
Protection/Safety	95	95	95

E. Cost of No-Action (Including Loss): $3,086,000.00

F. Cost of Selected Alternative (Including Loss): $326,020.00

G. Skills Represented on Burned-Area Survey Team: See Appendix B – Team Roster

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

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H. **Treatment Narrative:**

Land Treatments:

Areas of high and some intermingled moderate burn severity areas would be seeded with a quick germinating nonpersistent annual cereal barley that would provide rapid ground cover and native perennial species that would give the burned area a jump start in natural recovery and provide for long term ground cover. Seeding would reduce negative impacts to soil productivity, hydrologic function, reduce soil erosion and reduce threats to downslope road infrastructure by reducing erosion and runoff. The treatment area is identified on the attached seeding map. (Appendix C) The proposed seed mix is identified in the table below.

Seeding is necessary to provide vegetative ground cover where the soil seedbank has been eliminated. A majority of the high burn severity that occurred as a result of the Signal Fire burned in mature mixed conifer. Dense, closed canopy accumulated a thick layer of duff over approximately a 150-250 year period, essentially excluding forb or graminoid cover. The tree seeds are often destroyed in the organic duff layer, as are grass and forb seeds. Seeds are consumed in the fire or heat sterilized. Therefore, these soils do not have a viable seed bank of their own and will not stabilize naturally without sacrificing site potential.

Certified Weed Free Seed Mix

Species	Planting Rate (pls #'s/acre)	Seeds/ft2 Contribution from Planting Rate
Barley (*Hordeum vulgare*)	12.00	41.80
Prairie Junegrass (*Koeleria macrantha*)	5.00	0.09
Mountain Brome (*Bromus marginatis*)	5.00	0.25
Muttongrass (*Poa fedleriana*)	5.00	3.40
BottleBrush Squirreltail (*Elymus elymoides*)	1.00	0.23
Total	28.00	45.77

Channel Treatments:
Remove floatable woody material in drainages that intersect Forest roads 154, 855a and 149. This is being proposed so that culverts are not plugged with floatable material during rain events and these Forest roads are not further damaged by high flow events.

Road Treatments:
12.5 miles of road will be treated with additional drainage structures and prep work to mitigate negative impacts to the forest roads that provide access to year round private residences, a forest service lookout tower and a communications site. There are two main roads that are critical access points to this portion of the forest. Without these roads public safety would be greatly reduced for the permenent residents that reside in the private inholding as well as the forest service lookout. Maintence on the communication towers on Black Peak would also be negativley affected if these roads were to fail. Below is a breakdown of the various treatments that would be implemented to these 2 key access points.

- Clean culvert inlet and outlet. This work shall include cleaning the inlet and outlet of culverts to maximize flow and rebuilding ditch blocks to insure culvert is at capacity. A backhoe would be used for this task and operated on the shoulder of the existing roadway.
- Armor leadout ditch and culvert outlets with riprap. This work shall include the placement of 6" – 24" rip rap borrow on roadway shoulder and or ditch line. A backhoe, trackhoe or dozer will be used to shape or place.
- Install low standard rolling grade dips. The existing roadway would be excavated and lead out ditch or sediment trap constructed. A dozer would be used for this task and disturbance may extend 10' below each dip to insure proper operation.
- Construct broad based rolling dips. Grade dip would be constructed to insure roadway drainage operation. A dozer would be used for this task.

- Channel cleaning per mile. This treatment is intended to remove floatable debris and reestablish channel opening to maximize drainage capacity during high flows.
- Install closure gates. Install metal closure gate at locations identified for traffic management.
- Install 6 low water crossings to accommodate increased flows.

Trail Treatments:
Trail drainage stabilization to handle increased flows will be done on 2.5 miles of the Continental Divide Trail. Waterbars will be added to prevent damage and excessive erosion of this National Senic Trail. Removal of hazard trees along this trail.

Protection/Safety Treatments:
Install hazard warning signs at key entry points around the burned area. These will be posted on roads and trailheads. Two clusure gates are to be installed, one on FR 154 which acesses the majority of the burned area and on on FR 149 to keep people out of disperced camping areas along Meadow Creek. Hazard tree removal along Forest roads 154, 855A and 149 where road work and channel clearing will take place.

Storm Inspection and Response
Roads affected by the Signal Fire have numerous drainages that intersect the roads. These drainages are located on steep slopes with high burn severity. Many of these drainages go thru over a mile of high severity burn before they intersect the road. These draiages now have the potential for significant increases in runoff and debris flows. The patrols are used to identify road problems such as plugged culverts and washed out roads and to clear, or make passable those road segments that are damaged. Storm Inspection and Response is vital in providing for public safety and to mitigate excessive negative impacts to the Forest road sytem.

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.

I. **Monitoring Narrative:**
Seeding Implementation Monitoring
Field monitoring visits to assure correct seeding application rates are applied to the treatment units in the Signal Fire. This will be accomplished by treatment inspector and project COR.

Level 2 Seeding Effectiveness Monitoring
Level 2 monitoring of the effects seeding with annual barley and native seed mix has on erosion rates from seeded verses non treated sites. This will be accomplished through establishing an analytical plot ground cover transect, establishment of 4 erosion catchment structures and permenant photo points. This will be a 3 year monitoring project. (Monitoring Plan submitted separately on 5/28/2014)

Part VI – Emergency Stabilization Treatments and Source of Funds **Next page**

			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	acres	100	1,525	$152,500	$0		$0		$0	$152,500
				$0	$0		$0		$0	$0
Subtotal Land Treatments				$152,500	$0		$0		$0	$152,500
B. Channel Treatments										
Channel Clearing	miles	3,000	2	$6,000	$0		$0		$0	$6,000
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$6,000	$0		$0		$0	$6,000
C. Road and Trails										
CDT Trail Drainage	miles	3,600	2.5	$9,000	$0		$0		$0	$9,000
Road Prep	miles	6,600	12.5	$82,500			$0		$0	$82,500
Storm Patrol and Resp	pay period	12,500	3	$37,500			$0		$0	$37,500
Rip Rap	per	100	75	$7,500			$0		$0	$7,500
Low water crossing ins	unit	2,500	6	$15,000			$0		$0	$15,000
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$151,500	$0		$0		$0	$151,500
D. Protection/Safety										
Road Closure Gates	per	4,000	2	$8,000	$0		$0		$0	$8,000
Hazard/Closure signs	per	60	17	$1,020	$0		$0		$0	$1,020
Hazard Tree Removal	miles	1,000	7	$7,000			$0		$0	$7,000
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$16,020	$0		$0		$0	$16,020
E. BAER Evaluation					$25,000					$25,000
				---			$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$0		$0		$0	$0
F. Monitoring	job	1		$30,000						
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$30,000	$0		$0		$0	$0
G. Totals				$356,020	$0		**$0**		**$0**	**$326,020**
Previously approved										
Total for this request				**$356,020**						

PART VII - APPROVALS

1. /s/ Kelly Russell — 5/25/14
   Forest Supervisor (signature) — Date

2. /s/ Gilbert Zepeda (*for*) — 5/30/2014
   Regional Forester (signature) — Date