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

Date of Report: August 21, 2008

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: Hot Air

B. Fire Number: AZ-ASF-080055

C. State: AZ

D. County: Greenlee

E. Region: 03 Southwestern

F. Forest: 01 Apache-Sitgreaves

G. District: 02 Clifton

H. Fire Incident Job Code: P3D8QJ

I. Date Fire Started: June 22, 2008

J. Date Fire Contained: July 18, 2008

K. Suppression Cost: $562,000 as of 7/22/2008

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 0
2. Fireline seeded (miles): 0
3. Other (identify): One corral repaired which was damaged in the backburning
(No hand or dozer firelines were constructed within this fire. Backburning was the principal suppression tool.)

M. Watershed Number: 1504000502 Upper Eagle Creek and 1504000407 Lower Blue River

N. Total Acres Burned:
NFS Acres(8925) Other Federal (0) State (0) Private (0)

O. Vegetation Types: Ponderosa pine, Mixed conifer, Pinyon-Juniper woodland, chapparal

P. Dominant Soils: Typic & Lithic Haplustalfs, loamy-skeletal and clayey-skeletal, mixed (HSM 5-1,HSC 5-0 & 6-1) TEUI MU # 538, 601, 628, 650, 732

Q. Geologic Types: Mixed basalts and pyroclastics

R. Miles of Stream Channels by Order or Class: Perennial 1.54, Intermittent 24.5, Ephemeral 1.40+

S. Transportation System

Trails :21.1 miles Roads: 14.1 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 6144 (low/unburned) 2123 (moderate) 657 (high)

B. Water-Repellent Soil (acres):1718

C. Soil Erosion Hazard Rating (acres):
1249 (slight) 0 (moderate) 8459 (severe)

D. Erosion Potential: 9.9 tons/acre

E. Sediment Potential: 2,314 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 80-90

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

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 1.96

F. Design Flow, (cubic feet / second/ square mile): 194

G. Estimated Reduction in Infiltration, (percent): 80

H. Adjusted Design Flow, (cfs per square mile): 276

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Human Life/Propery

The Hot Air Fire burned directly adjacent to Highway 191, the principal and only paved transportation route in east central Arizona east of the Globe/ShowLow corridor. Besides being an important transportation corridor, this highway is designated a National Scenic Byway and has several popular developed and designated dispersed recreation sites within the burned area. These sites include the Hagan Trailhead/Day Use Recreation Site, the Eagle Divide Trailhead/Day Use Recreation Site, the Sheep Saddle Trailhead/Day Use Recreation Site, the Robinsaon Mesa Trailhead/Day Use Recreation Site, and the Rose Peak

Trailhead/Day Use Recreation Site. There are also several popular dispersed recreation camping sites along Highway 191 and adjacent level 2 roads in the burned area. These recreation resources are some of the only such facilities between Clifton and Alpine AZ accessed by paved highways. The trails leading from the above trailheads provide access to some of the most popular recreation lands on the Clifton District including portions of the Blue River Primitive Area.

Burned stands are nearly continuous for 5.2 miles along the east side of the highway and for an additional 4.3 miles on both sides of the highway. Stands adjacent to the highway and other roads that sustained moderate or high burn severity have numerous dead and dying trees which pose a moderate to high risk to public health and safety to those travelling the highway, using the dispersed recreation facilities, and camping at the dispersed recreation camp sites .

Other than at the trailheads, the only trail section where the fire resulted in hazard trees which present a high risk to human safety is the upper portion of the Robinson Mesa Trail. This is one of the most popular trail segments for day users along the Highway 191 recreation/travel corridor.

The Hot Air Fire burned through the site of a semi-permanent soft release wolf re-introduction facility used on a continuing basis for re-introduction of Mexican gray wolves. This facility, located near Engineer Spring, is property of the Arizona Game and Fish Department and is authorized by the Forest Service under Special Use Permit which is valid through 2010. The facility is now subject to high risk of impairment due to damage from falling dead or fire weakened trees.

Wilderness

The Blue Range Primitive Area, which is managed as Wilderness, is located 1 to 3 miles to the east of the Hot Air Fire perimeter. The Strayhorse Creek conveys water flows from the Hot Air Fire across this Primitive Area. A Special Management Area, the Blue Range Addition, is located between Highway 191 and the boundary of the Blue Primitive Area. The Forest implements management policies within this SMA similar to those in the Blue Range Primitive Area. Approximately 25% of the Hot Air Fire is within the Blue Range Addition, including some of the high severity burn area.

Recreation Resources

Dead snags and fire weakened trees pose a significant risk to information kiosks, trailhead facilities, corrals, and picnic tables at the five Trailhead/Day Use sites described under Human Life/ and property.

Numerous recreation trails have trailheads on the Highway 191 corridor and cross burned areas of the Hot Air fire including the Hot Air, Eagle, War Finance, Robinson Mesa, Bear Spring, Hagan Corral, Strayhorse, Red Mountain, Rose Peak, and Bear Pen Springs Trails. The latter five trails lead down into the Blue Range Primitive Area passing through the Blue Range Addition. Beyond the roadside perimeter, these trails generally cross burned areas of low to moderate fire intensity. The risk of damage to the trails is low.

Archaeology

Based on previous project surveys, the Forest is aware of six heritage resource sites within the perimeter of the Hot Air Fire. All six sites were examined. Three of the sites are not at risk from fire effects since they were not exposed to fire, or were exposed to only low-intensity fire and are located in areas where no further impact is anticipated. Three other sites are at risk. The first is a prehistoric artifact scatter which was exposed to moderate burn severity that removed all of the ground cover and duff present. This site is at risk of disturbance due to erosion. The second site is a prehistoric habitation that was exposed to fires producing moderate burn severity. Many trees within the site were killed. The site is at risk of being damaged by falling dead trees within the site either by uprooting features or by trees falling on features. The third site is a lithic scatter on sloping lands that were exposed to fires producing high burn severity. Ground cover on the site has been burned off and most of the surrounding trees have been killed. Recent precipitation has caused some erosion channels (rills). This site is at risk of disturbance and loss due to erosion.

Water Resources

The Hot Air fire occurred along and adjacent to a major watershed divide between the Blue River and Eagle Creek watersheds. The burned areas are below but adjacent to the Mogollon Rim, an area of the Forest subject to particularly frequent rainstorms during the summer monsoon season

Only moderate increases in peak flow in response to a 25 year storm event are forecast as a result of the fire. The initial monsoon season rains have already commenced and so far this year have been at lower than normal to normal intensities. Hydrophobicity is still evident in soils subject to high burn severity and in much of the moderate burn severity areas. It is likely that the initial monsoon rains have moderated the levels of hydrophobicity below those that occurred immediately following the fire.

The lands burned in this fire are headwater areas characterized by broad forested ridgetops with steep sideslopes, either forested or dominated by chaparral depending on aspect. Runoff rates are naturally high, leading to flashy stream flow conditions in area streams. These streams are generally of steep gradient and intermittent in flow regime with limited obligate riparian vegetation. Stream channels are generally dominated by cobbles and are well armored. Stream degradation as a result of design peak flows is not anticipated.

The principal impacts on water resources would likely be water quality related. Ash input to and transport by streams has already been observed in response to initial monsoon rains. However, few riparian or aquatic values at risk occur in the headwaters reaches of these streams burned in the fire. Ash is not expected to be a signficant threat to those downstream reaches which do support fish and aquatic life due to their distance below the fire. Ash may be conveyed as far as the Blue River and East Eagle Creek but not at levels which would threaten fish and aquatic life in these streams. Sediment is being conveyed to the headwater reaches at the current time and is being efficienty transported downstream. Design level storms would likely greatlly increase the sediment loading to the streams. This sediment will, over time, be conveyed to East Eagle Creek, Eagle Creek, and the Blue River and add to the cumulative effect of sediment load on elements of fisheries habitat in the stream.

Soil Resources

A map of soil burn severity was obtained from RSAC prior to the start of the assessment. Soils personnel verified TEUI mapping, surface characteristics including post burn ground cover, and soil hydrophobicity; and validated and corrected soil burn severity mapping.

Overall, soil hydrophobicity was moderate to high in areas of high soil burn severity, and low to moderate within areas of moderate soil burn severity. Ground cover in high and moderate burn severity soils was mosty consumed. Low burn severity areas had most of the litter, duff and plant basal area left intact. A matrix of risk to soil resource (as well as noxious weeds) can be found in the treatments section below. The first group includes soils that have high soil erosion hazard on moderately steep and steep slopes associated with ponderosa pine and mixed conifer vegetation types. Approximately 285 acres of high and 1170 acres of moderate burn severity occurred in this group. Soil hydrophobicity ranged from low to high. Ground cover was entirely consumed in high severity areas and mostly consumed under moderate severity. Some rilling was observed within this grouping from recent rainstorms. Soils of moderate to low soil erosion hazard on nearly level to moderately sloping slopes associated with ponderosa pine vegetaton types (group 2) had 169 acres of high burn severity with 409 acres of moderate. In high severity areas, all ground cover was burned, and hydrophobicity was moderate to high. These soils are at lower risk to soil loss, but higher risk for noxious or non-native plants as these areas are easily accessable by vehicles and livestock. Areas associated with chaparral vegetation type (group 3) have soils with a severe erosion hazard, and have moderate to high levels of hydrophobicity. These soils are the most erosive and will produce the most sediment of all soils on the fire where soil burn severity is high. There are 278 acres of high and moderate soil burn severity within this type that would benefit from seeding.

Figure 1. Example of high soil burn severity, high erosion hazard slope

Fish

The Hot Air Fire burned the upper watershed areas of Hot Air Creek which is directly tributary to East Eagle Creek about 0.6 mile below the fire perimeter. East Eagle Creek and Eagle Creek consititute Critical Habitat for the Gila chub which is listed as Endangered. Portions of Eagle Creek are also designated Critical Habitat for the loach minnow which is listed as Threatened. The Hot Air fire burned portions of the upper watershed of Strayhorse Creek. Although unoccupied at this time, reaches of Strayhorse Creek have been identified as a recovery stream for Gila trout in the Gila Trout Recovery Plan. Gila trout is listed as Threatened. Strayhorse Creek is tributary to the Blue River approximately 7 miles below the fire perimeter. The Blue River is occupied and designated Criical Habitat for the loach minnow.

Destabilization of the watersheds with the potential for chronic sediment transport to the above streams is a risk to the maintenance of existing habitat conditions for these Threatened and Endangered fish.

Wildlife

A variety of wildlife species ranging from elk to turkeys occur within the Hot Air Fire perimeter. Of particular concern in relation to fire effects is the habitat of the Mexican Spotted Owl. Three of the ten MSO PACs on the Clifton Ranger District occur within the perimeter of the Hot Air Fire – the Hot Air, Engineer Spring, and Brigham Peak PACs. Occupancy in each of these PACs was documented in 2007. Approximately 54% of the Brigham Peak PAC burned in the Hot Air Fire primarily at low and moderate fire intensities. Approximately 85% of the Engineer Spring PAC burned in the fire at mostly low and moderate fire intensities but with some areas of high intensity. Approximately 62% of the Hot Air PAC burned in this fire, primarily at low and moderate fire intensities but with areas of high fire intensity and crown fire. The remaining 42% of the PAC burned only 2-3 months prior to the Hot Air Fire in the Eagle Fire of April/May 2008 at low and moderate intensities. A fourth PAC, the Blue Vista PAC, is located about 3 miles north of the Hot Air Fire. This PAC received significant wildfire effects from the Chitty Fire of 2007. 64% of the PAC was burned by crown and high intensity fire. As a consequence of the Hot Air and other recent fires, the PACs in this area have modified Primary Constituent Elements for prey base on the short-term and forest structure on the long-term. As identified in the MSO Recovery Plan and demonstrated by fires in recent years,

uncharacteristic wild fire continues to be the greatest risk to Mexican Spotted Owl populations in the Upper Gila Mountain Recovery Unit. It is believed that through treatments of the soil and watershed resources the risks will be mitigated to future Primary Constituent Elements for short term prey base and long term forest structure.

Invasive Species

Highway 191 is an important and well-used transportation and recreation corridor attracting users from across the Southwestern United States, including hikers and hunters who use back country resources. Automobile traffic could potentially transfer State A-Rated invasive plant species from outside the area to the roadside and along the level 2 roads in the fire perimeter. In addition, the previously described recreational facilities and trails are all routes of potential establishment sites for invasive species seeds transported to the burned area by passenger vehicles, off-highway-vehicles, maverick and permitted livestock, pack and saddle stock, hunting dogs, hunters and hikers. Little existing information is available on the extent of existing occurences

B. Emergency Treatment Objectives:

Provide for public safety – a) Reduce the risk of exposure of the public to injury from falling hazard trees near trailheads, dispersed camping sites, rest areas, in the heavily used day use section of the Robinson Mesa trail and along Highway 191 and other vehicular travelways to ensure their safety. b) Increase the awareness of Forest visitors of fire created hazards along trails, roads, and in the backcountry affected by this fire.

Limit damage to property – a) Reduce the risk of damage to the mexican grey wolf soft release re-introduction facilities. b) Reduce the risk from damage by falling hazard trees to existing recreation facilities along the Highway 191 corridor.

Limit loss of soil productivity due to erosion – Reduce the risk of damaging levels of soil loss and maintain basic soil productivity levels on those areas experiencing substantial increase in erision hazard due to fire effects (primarily in areas with high and moderate burn severity).

Limit stream sedimentation and water quality impacts on ESA fish species - Reduce on-site soil erosion and subsequent delivery of sediment to the headwaters of stream containing or leading directly to streams with occupied and/or Critical habitat for the Endangered Gila chub and the Threatened Loach minnow and in designated recovery streams for the Threatened Gila trout.

Limit noxious and invasive species encroachment into the burn area – a) Reduce the risk of introduction of noxious and invasive plant species into areas with high potential for establishment due to fire induced changes to soil, litter and native plant communtiies and due to proximiity to the Highway 191 travel corridor. b) Reduce the risk of spread of noxious and invasive species from area where they do become established within the Hot Air Fire perimeter.

Limit damage to and protect the integrity of identified heritage resources – Reduce or prevent the risk of damange to three identified sites due to erosion or damage from falling dead or fire weakened trees.

Prevent impacts to the Wilderness characteristics being managed for within the Blue Range Addition due to BAER activities

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

Land **80** % Channel **NA** % Roads/Trails **NA** % Protection/Safety **80** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	60	80	85

Channel	NA	NA	NA
Roads/Trails	NA	NA	NA
Protection/Safety	85	85	50

E. Cost of No-Action (Including Loss): $1,648,050

F. Cost of Selected Alternative (Including Loss): $1,529,855

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Chris Nelson

Email: canelson@fs.fed.us Phone: (928) 333-7303 FAX(928) 333-5966

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:

Aerial Seeding: Aerial seed all high soil burn severity areas and moderate severity areas with severe erosion hazard to reduce loss of soil productivity and the risk of infestation of noxious or non-native plant species. Treatment priority is based on the following risk table. Total acres seeded amounts to 789 acres. Species selected based on highly successful treatments on other ASNF BAER projects which result in quick cover from cereal grain, and persistent cover of native grass species.

Relative Risk of threats to protection of soil productivity and noxious/non-native plant species infestations.

	Soil Burn Severity			Noxious Weed Invasion Potential	
Erosion Hazard	High	Moderate	Low	High	Low
Severe	High	High	Low	High	Low
Slight	Low	Low	Low	High	Low

High risk areas will be seeded, Low risk areas will not. Positive effects of the seeding will persist into the next monsoon season in 2009 when emergency conditions are likely to persist. No seeding is scheduled on approximately 190 acres of high risk area within the Blue Range Primitive Area, which is currently managed as wilderness, to protect wilderness values.

Seeding mix and rate as follows:

Species	Percent	Seeds/square ft.
Mountain brome *Bromus marginatus*	30	7
Slender wheatgrass *Elymus trachycaulus ssp. trachycaulus*	30	7
Arizona fescue *Festuca arizonica*	10	3.5
Barley *Hordium vulgare*	30	17.5
totals	100%	25

August 21 update:

Interim #1 request is for additional funding due to higher bid costs than expected. Seed mix proportions and application rate has been adjusted to assist in containing costs.

Log Erosion Barriers: **Not Approved 8/4/08** ~~Re-bed and add to the existing log erosion barriers (cross felling) that were cut during the suppression effort on a total of 95 acres of high burn severity, high erosion hazard slopes. These trees were felled in two very steep areas on the contour by fire suppression crews in anticipation of post-fire rehabilitation needs but will not be effective erosion control measures unless properly bucked and bedded. Some may need adjustment in placement as well.~~

Figure 2. One example of crossfelled/hazard tree that would benefit from additional bedding.

Weed detection/treatment: Perform survey of noxious and non-native plant species within 3 months and again next summer. Provide immediate treatment if populations are found.

Expected Benefits of Land Treatments

- reduced soil loss / maintenance of on-site soil productivity
- reduced sedimentation in area streams and reduced water quality related impacts to critical habitat of loach minnow, Gila chub and potential habitat of Gila trout (as well as other aquatic species)
- reduction of potential for introduction and/or spread of noxious and non-native species in treated areas
- indirect benefits to terrestrial and other avian wildlife species via rehabilitation of habitat for prey base, of cover, forage resources and MSO habitat.

Channel Treatments: None prescribed.

Roads and Trail Treatments: None prescribed

Protection/Safety Treatments:

Remove hazard trees within close proximity to Highway 191 including five trailhead/day use recreation sites. Also remove hazard trees in and adjacent to dispersed recreation camping sites and open roads along the Highway 191 transportation corrider. Approximately 110 acres have been identified for some level of snag and hazard tree removal to reduce risk of life and property in areas where public access is allowed.

Purchase/install three metal barrier gates to eliminate vehicular access to areas where extensive hazard tree reduction will be needed as part of long term rehab and to control the influx of noxious/non-native and invasive plant species. The area is a popular destination for camping, hiking and hunting. Due to its distance from District offices, the area is not amenable to routine monitoring by district personnel and law enforcement during periods of high use by recreationists. Gates also allow for future treatment of an expected large fuel buildup from fire killed trees.

Place two warning signs along Highway 191 on each end of the fire to alert travellers to the general fire related hazards within the area. Place warning signs at each of six separate trailheads within the fire perimeter to alert Forest users to the hazards that may be encountered along the trails resulting from the Hot Air Fire.

Seed three archaeological sites to prevent additional erosion and to partially conceal artifacts. Carefully cut dead and fire weakened trees at one site to reduce risk of damage to the prehistoric habitation at the site. Apply straw mulch to one site to help provide extra and immediate protection from erosion.

Remove dead and fire weakened trees from within and adjacent to a Mexican gray wolf soft-release re-introduction facility to prevent its destruction by falling trees (this activity will be accomplished with non-BAER funds).

Expected Benefits of Protection/Safety Treatments

- improved safety for travellers along Highway 191 and users of National Forest recreation facilities and National Forest lands
- prevention of damage to or loss of heritage resources
- reduction of risk of establishment of noxious and non-native plant species
- protection of State owned Mexican gray wolf re-introduction facility

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.)

BAER effectiveness monitoring will be conducted to determine whether seeding and log erosion barriers are effective in reducing soil loss and sediment. Effective groundcover will be monitored for seeding success this fall and next summer. ~~Log barriers will be inspected randomly across the two treatment areas.~~ This will be conducted after end of this year's monsoon season and prior to 09 monsoon season. Monsoon rains generally produce high intensity, short duration storms that lead to the greatest resource damage on disturbed areas and to downstream drainages. Lack of effectiveness may warrant additional treatments, or repair of existing treatments or additional seeding.

Noxious/non-native species monitoring will occur as part of the original treatment and in following years, especially where public access is allowed, in seeded areas, and other high and moderate soil burn severity areas. This will be accomplished annually.

Part VI – Emergency Stabilization Treatments and Source of Funds **Interim # 1**

			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	46	789	$36,000	$0			$0		$0	$36,000
Seeding higher costs	acres	20	789	$16,000	$0			$0		$0	$16,000
~~Log Erosion Barriers~~	~~acres~~	~~390~~	~~95~~	~~$37,050~~	$0			$0		$0	~~$37,050~~
Weed detection	survey	2000	1	$2,000	$0			$0		$0	$2,000
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Land Treatments				$54,000	$0			$0		$0	$54,000
B. Channel Treatments											
None				$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											
None				$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											
Protect Arch. Sites	sites	500	3	$1,500	$0			$0		$0	$1,500
Hazard tree removal	acres	110	20	$2,200	$0			$0		$0	$2,200
Lockable gates	each	3	2000	$6,000	$0						$6,000
Highway warning sign	each	2	500	$1,000	$0			$0		$0	$1,000
Trail warning signs	each	6	150	$900	$0			$0		$0	$900
Insert new items above this line!											
Subtotal Structures				$11,600	$0			$0		$0	$11,600
E. BAER Evaluation											
Insert new items above this line!				---	$19,500			$0		$0	$19,500
Subtotal Evaluation				---	$19,500			$0		$0	$19,500
F. Monitoring											
Weed survey 09	days	600	3	$1,800	$0			$0		$0	$1,800
Seeding/barrier	days	600	1	$600	$0			$0		$0	$600
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Monitoring				$2,400	$0			$0		$0	$2,400
G. Totals				$68,000	$19,500			**$0**		**$0**	**$87,500**
Previously approved				$52,000							
Total for this request				**$16,000**							

PART VII - APPROVALS

1. *Allison L. Stewart* *8/21/2008*
Acting Forest Supervisor (signature) Date

2. _____ _____
Regional Forester (signature) Date