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

Date of Report: 30 June 2006

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
[x] 3. No Treatment Recommendation

B. Type of Action

[ ] 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

[x] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Lion Creek

B. Fire Number: UT MLF-006091

C. State: Colorado

D. County: Montrose

E. Region: 4

F. Forest: Manti – La Sal

G. District: Moab-Monticello

H. Fire Incident Job Code: P4CQ6X

I. Date Fire Started: 21 June 2006

J. Date Fire Contained: 26 June 2006

K. Suppression Cost: $980,000

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 8.4
2. Fireline seeded (miles): none
3. Other (identify):

M. Watershed Number: 1403000211

N. Total Acres Burned:
NFS Acres (1460) Other Federal (39) State ( ) Private ( )

O. Vegetation Types: Pinyon-Juniper; Ponderosa Pine-Gambel Oak; Sagebrush treated as a range project

P. Dominant Soils: Burnac-Delson-Falcon, sandy loam 20-50%

Q. Geologic Types: Wingate,

R. Miles of Stream Channels by Order or Class: 1.4 miles of perennial stream, 3.13 miles of intermittent drainages, and 2.37 miles of ephemeral drainages are within the burn area.

S. Transportation System

Trails: 0 miles Roads: 4 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 327 (low) 922 (moderate) 250 (high)
a. Burn Intensity (acres): 327 (low) 92 (moderate) 1080 (high)

B. Water-Repellent Soil (acres): 250

C. Soil Erosion Hazard Rating (acres):
___ (low) 1499 (moderate) ___ (high)

D. Erosion Potential: not calculated tons/acre

E. Sediment Potential: not calculated cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

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

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

D. Design Storm Duration, (hours): ____

E. Design Storm Magnitude, (inches):

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

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

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

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats: **See the narrative at the end of this form.**

B. Emergency Treatment Objectives:

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):

G. Skills Represented on Burned-Area Survey Team:

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

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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:

Channel Treatments:

Roads and Trail Treatments:

Protection/Safety Treatments:

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.)

None proposed. Noxious weeds and hazard trees will be monitoried as part of the regular Forest program of work.

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										
				$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 Land Treatments				$0	$0		$0		$0	$0
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
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$0	$0		$0		$0	$0
D. Protection/Safety										
				$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 Structures				$0	$0		$0		$0	$0
E. BAER Evaluation										
BAER team	days	340	21	$7,140			$0		$0	$7,140
travel				$500			$0		$0	$500
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$7,640		$0		$0	$7,640
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				$0	$7,640		**$0**		**$0**	**$7,640**
Previously approved										
Total for this request				**$0**						$7,640

PART VII - APPROVALS

1. _____ _____
Forest Supervisor (signature) Date

2. _____ _____
Regional Forester (signature) Date

Lion Creek Fire, Moab- Monticello District, Manti-La Sal NF
BAER Assessment, 30 June 2006

Introduction

A rollover car accident on the Paradox Road started the Lion Creek Fire on June 20th 2006. The Fire quickly escalated due to strong winds pushing the blaze to the north east across West Paradox Creek and up onto the adjacent mesa. A change in the wind direction later that day turned the fire back onto burned areas and the fire slowed significantly. When the fire was contained on June 26th, 1499 acres of mostly Pinion- Juniper were burned. Of these acres 327 acres were burned at low intensity, 92 acres at moderate intensity and 1080 acres were burned at high intensity.

Values at Risk

Values at risk were developed through scoping done by the incident command team and Forest representatives prior to the arrival of the BAER team. The BAER team used these values to guide the field investigation of conditions warranting possible emergency response. They include the Paradox Irrigation system, bridges and culverts, residences and other buildings adjacent to the fire in Paradox Valley, and cultural/archeological resources.

Condition of the Burned Area

Uplands, Intermittent and Ephemeral Drainages

Terrain Features: The topography throughout the burn area is characterized by multiple, structural, backsloped benches. This benchy topography tends to break up flow paths and reduce the convergence of overland flows into channels. Where present, channels were bedrock lined and tended to settle out sediment in discrete intervals along their length. Thin soils and abundant surface rock suggest that these drainages were flashy in flow before the fire occurred.

Intensity: The fire burned at a high intensity within the majority of the burn area with the exception of a fringe of low fire intensity around the outer perimeter. The fire spotted into West Paradox Creek Canyon except for a quarter mile section of the stream which was burned at moderate to high intensity. See the map attached as a separate file.

Severity: Of the area that was burned at high intensity, in pinion/juniper/shrubland communities the shrubs were reduced to stubs and the needles and smaller branches on pinion and juniper were completely consumed. Soils under pinion and juniper stands exhibited some alteration depending on pre-fire duff depths. In areas where more duff was present, soil surfaces exhibited moderate to strong surface hydrophobicity. No soil hydrophobicity at depth occurred. The majority of the ponderosa pines were completely scorched and blackened although dead needles were mostly present. Soils under ponderosa pine stands exhibited a higher likelihood of having strong soil hydrophobicity at the surface and moderate hydrophobicity at a depth of 1 inch in a few places. Where burned, the sagebrush and grass in the flats were completely consumed although soils were lightly affected. Biotic crusts present around the bases of sagebrush may survive. Small portions of the sagebrush seedings were not burned. Based on these observations, the acres of high severity where both vegetation and soils were altered is mostly under ponderosa pine stands and in a few pinion/juniper/shrub communities. There are approximately 250 acres of high burn severity and 922 acres of moderate burn severity.

Hydrophobicity

Soils within the burn in the area tributary to West Paradox Creek were tested for hydrophobicity at sixteen locations. Of these locations, six exhibited strong surficial hydrophobicity and two showed strong hydrophobicity at the surface and moderate hydrophobicity at a depth of one inch. Both of these two sites were located in ponderosa pine stands that had larger pre-fire duff layer conditions. Based on this information, we

interpolated that about 250 acres of the burn area suffered significant soil alteration and could be categorized as hydrophobic. See the map attached as a separate file.

Residual Ground Cover

Litter: Very little litter remains through much of the area burned under high intensity conditions. Very little litter was present before the fire in the lower elevation pinion/juniper communities and the sagebrush/seeding area. The higher elevation pinion/juniper/shrubland communities and ponderosa pine stands did have considerable amounts of pre-fire litter. Litter was reduced to ash in these communities although an organic soil horizon remains. Quick sprouting of shrubs is expected where they were present.

Rock: Rock comprised a large proportion of the ground surface throughout the burn area. It varied from boulder sized material over 40% of the ground surface, to cobble and gravel size classes comprising 20% of the ground surface. The only area that did not have surface rock was the sagebrush-seedings.

Biotic Soil Crust: The base of sagebrush plants were well covered with moss and biotic soil crust. Although burnt, it is possible that parts of the crust would survive and spread. The residual biotic crust is not hydrophobic. Also significant amounts mychorizie was present in the soil throughout the burn area. This will provide some soil stability and improve recovery potential.

West Paradox Creek

A quarter mile section of West Paradox Creek including the side slopes and riparian area was burned at a moderate to high intensity level. Douglas Fir conifers were scorched and should provide a source for cast needles and might also fall over in the next few years. Riparian vegetation, including alder and red osier dogwood was not root killed and should re-sprout quickly. Side-slopes are steep but not long due to structural benches that would serve to break up flow paths. The stream is a steep, bouldery step pool (Rosgen classification A2) and is not dependent upon vegetation for streambank stability. Because of the shallow soils, abundant surface rock and large amount of bare ground present before the area burned, the pre-fire hydrograph of tributary intermittent/ephemeral channels was flashy in nature. The removal of vegetation may make them flashier but probably not measurably more so.

Conclusions

Ash and Sediment

Ash flows are expected to occur during the first few storms of the coming monsoon season. These flows may travel the length of West Paradox Creek to Paradox Valley depending on the intensity and duration of convective events. Some transport of sediment could also occur; however, it is most likely that it will be deposited and stored in slope breaks commonly found along intermittent and ephemeral channels rather than being transported to West Paradox Creek.

Potential for debris loading in West Paradox Creek

Dead trees in the uplands will be falling over in the next few years as roots deteriorate and wind storms occur. It is unlikely that this woody material would be transported down to West Paradox Creek because of the benchy topography that breaks up flow paths and reduces the convergence of flows necessary to transport large woody debris. Some trees in the direct vicinity of the quarter mile section of West Paradox Creek burned at a moderate intensity will fall over and could land in the creek. Because of the narrow, steep and thickly vegetated reach downstream of this section of stream, it is unlikely that this material would be transported very far. Deep seated land slides are not expected to occur in this area (Carter Reed Forest Geologist, personal comm. June 27th 2006).

Potential for debris torrents

Intermittent and ephemeral channels present are bedrock lined and will not downcut and produce massive amounts of debris. No sign of past slope failure and debris torrent deposition were noted within the burn area. If a debris torrent were to occur in the West Paradox Watershed, it would most likely lose forward momentum when it made contact with slope breaks located along the intermittent channels above West Paradox Creek. If a debris torrent were to occur in the intermittent drainage on the east side of the fire, it would loose momentum in a flat located up canyon from the house adjacent to the canyon where the loss of valley confinement would contribute to energy dissipation.

Conclusions Relative to Values at Risk

Paradox Irrigation System

The fire was near Buckeye Reservoir in Montrose County, Colorado. This reservoir was developed to provide storage for irrigation water for Paradox Valley. West Paradox Creek is the conveyance system from the reservoir to the valley. The majority of the area affected by the fire is tributary to West Paradox Creek downstream of Buckeye Reservoir. The Paradox Irrigation system is approximately two stream miles downstream from the lowest point of the fire and consists of an open ditch system controlled with headgates (Clinton Oliver Paradox Water Commissioner, personal comm. June 26th 2006). Previous fires (Willow Basin, 1994) did not result in any problems for the irrigation system. Impacts to the irrigation system from anticipated ash flows and possible increased sediment would be mitigated by closing headgates, a process that is already in place for flash floods. The Water Commissioner did not voice any concerns about fire effects on the irrigation system. Based on these findings, there is not a need for emergency stabilization to protect the Paradox Irrigation System.

Bridges and Culverts

No major culverts or bridges are present on National Forest System lands in or downstream of the burned area. No culverts are present on county roads leading to the east side of the fire from the town of Paradox. In the Paradox Valley, there is one bridge across West Paradox Creek that serves a small subdivision and one culvert in a county road that could be affected by fire effects. The bridge has an opening of 15 feet wide and a clearance of five feet above low flow water level and the county road culvert is five feet in size. Because of the size of these structures and the low likelihood of debris from the fire being transported two miles downstream, there is not an emergency need to replace them with larger structures.

Residences And Other Buildings

The fire took place on mountain slopes and escarpments adjacent to the Paradox Valley. West Paradox Creek and several intermittent and ephemeral channels connect the mountain front and the valley. There are several residences and other buildings in the valley at the base of the escarpment and adjacent to the intermittent and ephemeral channels. On the east side of the fire, approximately a quarter of the intermittent drainage's watershed was burned mostly under moderate severity conditions with XX acres high severity. The main likely impact to the residences from the fire would be a debris torrent. Based on the discussion above, it is unlikely that a debris torrent would extend to the residences. About 10% of the headwaters of the ephemeral drainage were burned under moderate severity conditions. There is a large buffer of unburned watershed between the residences and the burned area. Therefore there is no anticipated impact from the ephemeral drainage on residences. No emergency stabilization needs were identified for residences and other buildings adjacent to the fire in the Paradox Valley.

Archeological Sites

The archaeological sites in the burned area are prehistoric lithic scatters that were burned to varying degrees, altering surface artifacts. No hydrophobic conditions were found on the sites and they appear to be stable and

located in low slope settings with fairly rocky/sandy sediment conditions. No emergency treatment or longer term rehabilitation is needed.

Recommendations for Rehabilitation and Restoration

Fences

Rangeland fences were burned in the fire that may require reconstruction for livestock management.

Reseeding of Chained/Seeded Areas

Reseeding of sagebrush/seedings may be considered from both a wildlife (Elk winter range) and livestock forage standpoint.

Restoration of Ponderosa Pine As A Component of the Ecosystem

Isolated ponderosa pine stands comprise a small portion of the burned area but add greatly to the overall habitat diversity of the area. Stands that were killed in the fire may require planting in order to reestablish.

Development of Ponderosa Pine Seed Stock

Collection and propagation of regional ponderosa pine seed stock may be necessary for planting efforts.