

Date of Report: 7/8/2004

BURNED-AREA REPORT

(Reference FSH 2509.13)

PART I - TYPE OF REQUEST**A. Type of Report**

- ☐ 1. Funding request for estimated WFSU-SULT funds
- ☒ 2. Accomplishment Report
- ☐ 3. No Treatment Recommendation

B. Type of Action

- ☐ 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation 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 DESCRIPTIONA. Fire Name: KPB. Fire Number: AZ-ASF-000017C. State: ArizonaD. County: GreenleeE. Region: SouthwesternF. Forest: Apache-SitgreavesG. District: AlpineH. Date Fire Started: 5-17-2004I. Date Fire Contained: 7-27-2004J. Suppression Cost: 4,120,000

K. Fire Suppression Damages Repaired with Suppression Funds

- 1. Fireline waterbarred (miles):
- 2. Fireline seeded (miles):
- 3. Other (identify):

L. Watershed Number: 1504000407, 1504000405, 1506000101, 1504000502M. Total Acres Burned: 16,625

NFS Acres (16,625) Other Federal () State () Private ()

N. Vegetation Types: Spruce Fir, Mixed Conifer, Ponderosa Pine, Pinyon Juniper, Oak BrushO. Dominant Soils: TES 130,131, 514, 560, 565, 579, 583, 585, 612, 690, 732P. Geologic Types: Basalt, Sandstone

Q. Miles of Stream Channels by Order or Class: 16.2 miles of perennial and 63.6 miles of intermittent

R. Transportation System

Trails: 24.55 miles Roads: 15.3 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 13441 (low/unburned) 2168 (moderate) 1016 (high)

B. Water-Repellent Soil (acres): 3184

C. Soil Erosion Hazard Rating (acres):
1277 (low) 649 (moderate) 14701 (high)

D. Erosion Potential: 19.8 tons/acre

E. Sediment Potential: 81,711 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

F. Design Flow, (cubic feet / second/ square mile): 184 (KP Creek Watershed)

G. Estimated Reduction in Infiltration, (percent): 60% (KP Creek Watershed)

H. Adjusted Design Flow, (cfs per square mile): 286 (KP Creek Watershed)

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

Life and private property: There is no known threat to life or property.

Water quality: An increase of ash flow is expected to create a chemical imbalance, i.e. pH and water ionic modification, and increase the biological oxygen demand. The increased sediment yield and bed load would increase turbidity and possibly interfere with nutrient cycling (spiraling). Greater fluctuations in temperature may result in the reaches within and immediately below the fire. KP Creek has been designated as a "unique water of the State of Arizona". Unique waters require more stringent protection measures than other surface waters under the antidegradation rule A.A.C. R18-11-107(D). Under antidegradation implementation procedures, activities that may result in a new or expanded discharge of pollutants to Unique Water (or its tributaries) are prohibited if the discharge would cause degradation of existing water quality. Baseline

information has been collected by ADEQ, although it was not available at the time of this request.

Water quantity: Hydrophobic soil conditions were encountered in much of the burned area in the upper portions of the KP Creek watershed. Patchy weak hydrophobicity was encountered in even the lightly burned areas. Moderate to strong hydrophobicity was encountered in the moderately to severely burned areas of this portion of the fire. Based on soil moisture, ground cover, and soil textural characteristics, we postulated that hydrophobicity would likely be encountered in the lower elevation watersheds though perhaps at moderated levels. Adding to the potential for increased flood flows in the KP Creek watershed is the high percentage of the upper and middle portions of the watershed that burned. These factors will result in an overall significant decrease in infiltration rates and increases in run-off for this drainage. Increased flooding can be expected in response to monsoon rains that are forecasted to begin this year in mid July.

The greatest increase in per-acre flood flow production will likely occur in the upper watershed of KP Creek which sustained the greatest overall extent of burn of those sub-watersheds involved in the fire and also exhibited significant hydrophobicity. (This was modeled at an approximate 80% increase.) The overall increase in flood peak in the KP Creek watershed will be somewhat less than this due to less severe burn impacts in the lower drainage. (This overall increase was modeled at 60%). McKittrick and Raspberry Creeks are expected to have lower increases in flood peaks (modeled at 30% and 20% increases, respectively).

Aquatic Species and Habitat: Direct fish kill from ash flow and sediment pulses are of immediate concern followed by an increase in already embedded substrates (that eliminate cover and spawning habitat), increase in channel instability and incision, which in turn reduces channel complexity, and a set back in the recovery of mature riparian galleries.

KP and McKittrick Creeks provide occupied habitat for Apache Trout *Oncorhynchus apache* (Threatened). These streams have also been identified as recovery streams for Gila trout *Oncorhynchus gilae* (Endangered). Raspberry Creek is the third perennial drainage within the fire and has a population of Gila trout. It is assumed that between 50 and 80 percent of the local population remains as 30 fish were emergency salvaged from the fire and are presently being held in the U.S. Fish and Wildlife's (FWS) Mora fish hatchery in New Mexico. It is hoped that these fish will be returned after the expected ash flow event brought on by summer rains, assuming following events will be minor.

The Blue River is the major long-term concern, as the watershed condition is unsatisfactory and any "upward trends" (PFC) may likely be reset. The Blue-River Complex of loach minnow *Tiaroga cobitis* is one of the more important complexes or sub-populations of loach minnow according to the FWS. Other Threatened or Endangered species of concern are spikedace *Meda fulgida*, Gila Chub *Gila intermedia*, razorback sucker *Xyrauchen texanus*, and Chiricahua leopard frog *Rana chiricahuensis*.

In regards to the habitat, The upper drainages will likely produce large volumes of runoffs in these transport dominated channels with further sediment entrainment and flash floods, resulting in large debris flows in the lower reaches of these drainages and Blue River proper. If sediment fluxes from surface runoff from these drainages and redistribution of channel geomorphology in lower reaches are severe and/or occur over multiple years; the effects to the patchy population distribution of loach minnow could be detrimental to their habitat in the Blue River (30 miles). Also, pulsed flows within these drainages and near reaches of the Blue River would likely reset the riparian recovery to mature galleries approximately 10 to 20 years. Cumulatively, the effects of natural and man caused sedimentation within the Blue watershed, including effects of roads, ungulate grazing, natural mass wasting are thought to have brought the continued existence of this loach minnow population to discussions of near jeopardy status. Even with the mitigation of additional sediment controlled with proposed treatments, current management within the watershed may be affected. Jeopardy status could require significant and costly road improvements to the Blue Road as nearly 75 percent of the road is considered a connected disturbed area. Ungulate grazing in areas of unsatisfactory watershed conditions could be affected by a jeopardy status. The potential loss of McKittrick and KP Creeks as recovery streams for Gila Trout would adversely affect the recovery plan and timelines for the species.

Wildlife Species and Habitat: The species of greatest concern is the Mexican spotted owl *Strix occidentalis lucida*. Three owl Protected Activity Centers (PACs) were directly impacted by the fire and one PAC adjacent

to the fire may have been impacted by suppression activities. This does not include impacts to owl PACs that are/where in the immediately adjacent Blue Complex Fire that occurred less than a year ago. The KP fire as well as the Blue Complex fire has negatively affected the environmental baseline for MSO in the Southwest Region, USFS. Foraging habitat (prey species habitat) was also negatively impacted.

Soils Loss: Many areas that have a high to moderate burn severity are expected to exceed tolerable soil loss limits because of the high to moderate erosion hazard, hydrophobic soil conditions, steep slopes, loss of vegetative ground cover (VGC), soil structure deterioration, and overall organic matter loss.

The average pre-fire erosion rate for the entire fire was 2.6 tons/acre and the average post-fire rate 19.8 tons/acre. The average pre-fire sediment yield for the entire fire was 13073 tons/yr.

Roads and Trails: There are 15.3 miles of road within the fire perimeter of which 10.3 miles are along a watershed divide and not expected to suffer any adverse affects from the fire. The remaining 5 miles of road within the site are level 2 roads that are not regularly maintained and classified as 4X4 routes that are not recommended for passenger vehicles. There are 24.55 miles of trails which may be adversely affected by the fire. Trails are currently being inventoried. The inventory is being delayed due to problems with active fire within the perimeter. Additional work needed to reduce fire caused erosion will be requested in a future report if needed.

B. Emergency Treatment Objectives:

- Minimize the cumulative deterioration of the past 6 fires within the past 2 years that impacts the Blue River's riparian function, peak flows, water quality, and aquatic habitat.
- Protect water quality from excessive sedimentation and ash flows.
- Protect the critical and occupied riparian habitat for Threatened and Sensitive aquatic species.
- Minimize soil erosion to protect long-term productivity.
- Reduce the potential from damage producing floods.

C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:

Land 60 % Channel 60 % Roads % Other %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	85	85	85
Channel			
Roads			
Other			

E. Cost of No-Action (Including Loss): \$16,263,000

F. Cost of Selected Alternative (Including Loss): \$15,391,000

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range	<input type="checkbox"/>
<input type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input type="checkbox"/> Engineering	<input type="checkbox"/>
<input checked="" type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fisheries	<input checked="" type="checkbox"/> Research	<input checked="" type="checkbox"/> Landscape Arch	<input type="checkbox"/> GIS	

Team Leader: Chris Nelson

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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:

Aerial Seeding

Objective- Aerial seeding will occur in high and moderate burn severity areas where native plant recovery is too slow for effective erosion control to maintain adequate water quality and long-term productivity. A cover crop will be integrated with the native perennial seed mix to provide a quick vegetative ground cover response. A study on last year's fires (Thomas, Steeple) show no vegetative ground cover response in high severity burned areas without treatment. Moderate severity areas have some protection provided from needle cast, but little vegetation response where ground litter and vegetation were completely removed.

Methods - 1375 acres of moderate and high burn severity acres will be aurally seeded. The seed mix will entail the following species: Mountain Brome (*Bromus marginatus*), Slender Wheat (*Elymus trachycaulus*), Annual Rye (*Lolium multiflorum*) and Annual Barley (*Hordium vulgare*). The area will be seeded with 25-seeds/sq. ft. rate.

Aerial Seeding was accomplished on 7/23/2004 with a fixed wing contractor. Seed and seed application contracts were provided by Forest contracting officers. The Forest supplied an airport manager and COR for application. Application took approximately 3 hours.

Straw Mulch

Objective - Protect the soil surface from raindrop impact, minimize soil loss and ash delivery to streams, enhance establishment of vegetation and reduce accelerated runoff where immediate ground cover protection is needed for effective erosion control and to protect water quality for aquatic habitat.

The mulching is expected to reduce the average erosion rate for the entire fire from 19.8 tons/acre to 18.7 tons/acre. The sediment yield is expected to reduce by approximately 8,700 tons/yr, primarily in the upper KP Creek watershed, where burn severity was the highest.

Methods – Approximately 338 acres will be mulched with certified weed free straw at 2000 lbs/acre rate. The mulch will be applied aurally through "heli-mulching" on high fire severity acres.

Mulch application was completed 7/26/2004. There are multiple advantages for using an experienced mulch application contractor over in-house fire personnel and Forest contracted helicopter. First, application rate was much higher than in previous years, as the contractor has ability to use heavy helicopters, with the ability to apply mulch at a rate of over 2000 lbs. per turn. In the Southwest,

application of mulch must be immediate to implement prior to the beginning of the monsoon season, or first damaging storm. Fire crews and contract helicopters are generally not readily available at this time. Contracted mulch applicators were available and completed the application quickly. There is also no need to provide logistics (camps, food, etc) for in-house crews with contracted mulch application. The Forest supplied and one helicopter manager for mulch application for the project.

Photos:



Grass seedling establishment 1 month after implementation



Mulch application rate 2000 lbs./ acre

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.)

Land Treatments: Measure the effects of slope treatments as a result of implementing aerial seeding and mulching in high and moderate burn severity areas, including survey for noxious weeds. Soil loss monitoring will be accomplished by evaluating soil stability and quality indicators. The vegetative recovery will be evaluated to determine the need for further treatments. Qualitative monitoring will occur for approximately 1 year, when a determination will be made if further treatment or monitoring is necessary.

Aquatic health: Fish density will be monitored for 1 year to determine the effectiveness of BAER treatments. At a minimum, population densities should remain viable if treatments are effective. Specific monitoring plan will be developed and submitted for approval in an interim report.

Monitoring sites were set up within the fire treatment areas. The Forest will submit an amended 2500-8 to request monitoring funds not spent in FY04.

Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

			NFS Lands				Other Lands			All	
		Unit	# of	WFSU	Other		# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	SULT \$	\$		units	\$	Units	\$	\$
A. Land Treatments											
Aerial Seeding	acres	30	1375	\$41,250	\$0			\$0		\$0	\$41,250
Aerial Straw Mulch	acres	565	338	\$190,970	\$0			\$0		\$0	\$190,970
				\$0	\$0			\$0		\$0	\$0
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Land Treatments				\$232,220	\$0			\$0		\$0	\$232,220
B. Channel Treatments											
				\$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
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Road & Trails				\$0	\$0			\$0		\$0	\$0
D. Structures											
				\$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											
Team	days	2581	7	\$18,067	\$0			\$0		\$0	\$18,067
				\$0	\$0			\$0		\$0	\$0
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Evaluation				\$18,067	\$0			\$0		\$0	\$18,067
F. Monitoring											
Land treat validation	Plan	7500	0	\$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				\$250,287	\$0			\$0		\$0	\$250,287

PART VII - APPROVALS

1. _____
Forest Supervisor (signature)

Date

2. _____
Regional Forester (signature)

Date