USDA-FOREST SERVICE FS-2500-8 (7/00)

Date of Report:2/26/2003

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[ ] 1. Funding request for estimated WFSU-SULT funds
[x] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

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

[x] 2. Interim Report
[] Updating the initial funding request based on more accurate site data or design analysis
[x] Status of accomplishments to date

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

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: RODEO/CHEDISKI COMPLEX B. Fire Number: AZ-FTA-251

C. State: AZ D. County: NAVAJO

E. Region:03 F. Forest: APACHE-SITGREAVES/TONTO

G. District: BLACK MESA/LAKESIDE/PLEASANT VALLEY

H. Date Fire Started:06/19/2002 I. Date Fire Contained: 07/07/02

J. Suppression Cost: 46 million

K. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 185
2. Fireline seeded (miles): 185
3. Other (identify): unknown

L. Watershed Number:

M. Total Acres Burned: 462,614
NFS Acres(177,439) Other Federal (276,512) State ( ) Private (8,664)

N. Vegetation Types: Predominanatly Ponderosa pine

O. Dominant Soils: Typic Haplustalfs, LSC, 5, 0. fine clayey skeletal

P. Geologic Types: Colorado Plateau - Ts; sandstone,shale and conglomerate, Ks; limestone, shale and sandstone.

Q. Miles of Stream Channels by Order or Class: 7.5 perennial, 548.3 intermittent (NFS & Private)

R. Transportation System

Trails: 108 (NFS & Private) miles Roads: 846 (NFS & Private) miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 45,385 (low) 35,483 (moderate) 52,389 (high)

B. Water-Repellent Soil (acres): 26,194

C. Soil Erosion Hazard Rating (acres):
77,118 (low) 56,292 (moderate) 52,389 (high)

D. Erosion Potential: 8.5 tons/acre

E. Sediment Potential: 1600 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): 2.0 inches

F. Design Flow, (cubic feet / second/ square mile): 80 - 245

G. Estimated Reduction in Infiltration, (percent): 20

H. Adjusted Design Flow, (cfs per square mile): 125 – 1500

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:
1) CRITICAL INFRASTRUCTURE – ARIZONA HIGHWAY 260 AT FLOOD RISK
2) MULTIPLE PRIVATE INHOLDINGS AT FLOOD RISK, INCLUDING COMMUNITIES OF HEBER, OVERGAARD, ARIPINE, CLAY SPRINGS, PINEDALE AND LINDEN AND OTHER LARGE UNINCORPORATED SUBDIVISIONS.
3) BLACK CANYON RESERVOIR AND MULTIPLE STOCKPOND SPILLWAYS AT FLOOD RISK
4) KNOWN ELIGIBLE CULTURAL RESOURCES, INCLUDING BURIAL GROUNDS, AT RISK OF ACCELERATED EROSION AND DEGRADATION.
5) APPROXIMATELY 50 MILES OF FIRELINES BUILT ON NF BY SUBDIVISION RESIDENTS ARE AT RISK OF ACCELERATED EROSION.

B. Emergency Treatment Objectives:

COVER – Seed mix to contain quick germinating nurse crop of barley and annual rye, along with mountain brome and slender wheat (same mix as used on cerro grande and other r-3 fires)

WARNINGS – flood warning signs

ROAD FILL PROTECTION – armor crossings with large fill over (now) undersized culvert to reduce or prevent the possiblity of breaching.

CULVERT REMOVAL – undersized culverts removed to prevent downstream matrix of debris

ROAD TREATMENT – attempt to reduce sediment delivery from National Forest System Roads

FLOOD THREAT REDUCTION – increase cover on watersheds that will flood downstream homes

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

Land **60** % Channel **N/A** % Roads **70** % Other **90** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	80	80
Channel	80	70	50
Roads	80	70	60
Other	100	100	100
Spotted owl	60	80	80

E. Cost of No-Action (Including Loss): **41 millon**

F. Cost of Selected Alternative (Including Loss): **23.9 millon**

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Gregory A. Kuyumjian

Email: gkuyumjian@fs.fed.us Phone: 505.412.0429 (CELL) FAX:

H. **Treatment Narrative:**

See attached spreadsheet for accomplishments, costs, and unit costs. Additional treatments were accomplished due to shift in treatment type from aerial and ground hydromulching to aerial and ground straw mulching. Accomplishments and descriptions in *italics*. Application of straw from hand crews to mechanized application by contractors allowed treatments to continue without a need for a camp after August 22.

Land Treatments: INITIAL AERIAL SEEDING OF 10,000 ACRES ON SEVERELY BURNED AREAS PREDOMINANTLY ON NORTH FACING SLOPES (This activity was approved on 6/27/02 & 7/8/02. Seed was delivered on 07/06/2002, application to start 7/11/02. Accomplished as of 07/12/2002 = 5500 acres). Total seeding request is 33,000 acres.

Total Acres seeded 48,796. Majority of seeding accomplished using fixed wing aircraft. Additional seeding accmplished with additional seed from district caches. See map for aerial extent of seeding.

Hazard Tree Removal, 302 miles, 1 tree length from major roads, along privately owned land where trees may fall on structures or other potentially occupied areas was accomplished for public safety and safety of rehab personnel

Heli Mulching 13,135 acres. This treatment replaced more expensive treatments such as aerial hydromulching or mulching by hand. A demonstration was given when implementation began, and was found to be an effective treatment. This treatment shifted from use of small straw bales to large 800 to 1000 lb bales. The larger bales were handled by contractors using equipment, thereby reducing the need for crews handling bales up to 4 times during placement which eliminated injuries from llifting and moving bales. The treatment was modified to strip mulching on steeper slopes, which allowed much more watershed areas to be treated than originally planned. High priority areas above privately owned land and in high risk watersheds were targeted.

Machine Straw 4516 acres. The treated areas were originally to be mulched using hand crews. Straw blowing machines were used to quickly mulch areas. Application rate increased from approximately 5 acres/day for hand crew to 3 to 4 acres/hour per machine. Approximately 2.2 large bales were applied per acre (2000 lbs./acre rate). Some dozer work was required to allow machine access to treat slopes up to 25 percent.

Hand Crew Straw: 326 acres. This was accomplished in Ross Draw. The remainder of this treatment was accomplished with Machine straw application.

Chipper: 26 acres. The treatment was determined to be too slow and equipment was difficult to manouver in the woods. The treatment area was accomplished by machine applied straw mulch.

Ground Hydromulch: 51 acres. The majority of this treatment was converted to machine straw mulch due to time constraints and lack of water supply.

Aerial Hydromulch: 0 acres. It was found that heli-mulching provided adequate cover at much lower cost. This allowed more area to be treated.

Volunteer Mulching: 708 acres. Volunteer groups spread mulch, bales distributed by volunteer 4 wheeler clubs and other methods.

Spotted Owl Habitat seed and mulch: Not approved.

Fish Hatchery Project: Completed as planned.

Heritage Protection: 9 sites seeded, mulched, log erosion barriers completed.

Channel Treatments:

Debris Clearing: 2.2 miles completed as planned.

Black Canyon Dam Debris Barrier: Up to $8,000 in materials were authorized. AGFD will supply labor. Not constructed as of this date.

Fence removal: 6 exclosure fence segments were removed to allow flood flows to pass.

Roads and Trail Treatments: FLOOD WARNING SIGNS (This activity was approved on 7/8/02. The signs have been ordered. Installation will occur immediately after arrival.)

Signs did not arrive until October. Signs were installed.

Road Emergency treatments: 128.1 miles: Includes improved drainage, removal of undersized culverts, construction and hardening of low water crossings to allow for debris and flood flows to pass. Retreatment was needed after summer rains to prepare for public access and to prevent further loss of road material from spring snowmelt runoff.

Structures: Eight stock tanks to be breached, one stock tank to get enlarged spillway. *Completed.*

Culvert removal – remove now undersized culverts (215 total) on FDRs that drain into private lands to reduce potential delivery of fill and culverts and potential multiple failures. Due to imminent threat of summer rains, the quickest treatment is culvert removal rather than armoring. A travel management plan will evaluate the need for culvert replacement after the emergency is over. It is estimated that less than half of these culverts will eventually be reinstalled. *Completed.*

Jersey Barriers – FR 86, exposed fill protection to reduce reopening road after each storm – road needed to access Black Canyon Reservoir (spillway) – must be keyed in. *Completed.*

Rip rap – large boulders along the 86 road where the road will be compromised by high flows – road needed to access Black Canyon Reservoir Spillway – alternate route to reservoir is FDR 300 which may not be passable with heavy equipment or useable during certain times.

Culvert inlet/outlet armoring – 6 crossings with high fill and now undersized culverts armored to allow for overtopping and reduce breach potential above private land deveopments located downstream. *Completed*

Grade dips – Current drainage spacing is not adequate to accommodate increased flows from adjacent slopes which have been burned in the fire. Increased flows would promote downslope failure of other drainage structures located downstream, such as stock tanks and larger culverts above private land.

Drainage Reconditioning – Current spacing of lead out ditches and openings at culvert outlets is inadequate to accommodate increased flows from adjacent steep slopes damaged in the fire. This work is intended to add additional lead out ditches and enlarge drainage outlets to handle these increased flows and reduce the potential for road failures above private lands.

Raised culvert inlets – using exiting culverts with high fills where removal is not immediate, install stand pipes to capture sediment and reduce risk of plugging existing culverts.

Ground or helicopter based straw mulch application – provides immediate cover, reduces runoff and sediment transport – applied as a treatment in watershed directly contributing to downstream life and property threats. (interchangeable)

Aerial based hydromulch- applied as a treatment in watersheds directly contributing to downstream life and property threats. Provides immediate cover and favorable conditions for revegetation. (interchangeable).

Ground based hydromulching – applied as a treatment in watersheds directly contributing to downstream life and property. (interchangeable).

Ground based chipping/slashing – provides iimmediate cover using material on-site in watersheds directly contributing to downstream life and property threats.(interchangeable)

Vault toilet cleaning/filling – 12 vaults now in danger of flooding need to be pumped and sanitized. One vault to be filled in for safety as structure was burned.

Jute/excelsior/erosion control cloth – (Tonto NF) –working with Arizona Game and Fish to Protect inlet works to fish hatchery and stabized immediate areas around facility. *Completed.*

Spotted Owl Pacs – see attached justification. Increase downed wood debris by dropping 3 trees/acre (1400 acres). Reseed with native plants (1600 acres). Partners to provide 115,000.

H. **Monitoring Narrative:**

Seed application will be via fixed wing "crop duster". Application rate will be calibrated at the airport and one foot squares will be in the field to record "catch".

Sign locations will be identified as they are installed.

Road work would be identified on maps with "as built".

Survey for weed invasion.

Re-examine cultural sites treated after "damaging rains."

Patrol roads during damaging rains.

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

A. Land Treatments										
seed & aerial applica.	acres	80	10,000	$800,000			$0		$0	$800,000
chipper/shredder	acres	250	1560	$390,000			$0			$390,000
ground hydromulch	acres	1800	730	$1,242,000						
straw mulch	acres	1200	2750	$3,300,000						
aerial hydromulch	acres	2800	1360	$3,808,000			$0		$0	$3,808,000
spotted owl habitat	acres	156	1600	$249,600					$115,000	$249,600
fish hatchery protect.	ea	6500	1	$6,500						
heritage site protect.	sites	4000	7	$28,000			$0		$0	$28,000
Subtotal Land Treatments				$9,824,100			$0		$115,000	$5,275,600
B. Channel Treatments										
debris clearing	miles	3000	9	$27,000			$0		$0	$27,000
fence removal	ea	250	4	$1,000			$0		$0	$0
trash rack (tonto)	ea	5000	9	$45,000			$0		$0	$45,000
				$0			$0		$0	$0
Subtotal Channel Treat.				$73,000			$0		$0	$72,000
C. Road and Trails										
road emergency	mile	1800	37	$66,000						
signs (tonto)	ea	2500	2	$5,000			$0		$0	
Subtotal Road & Trails				$71,000			$0		$0	#REF!
D. Structures										
vault toilet clean	ea	500	12	$6,000						
vault toilet fill	ea	1000	1	$1,000						
stock tank breach	ea	300	9	$2,700			$0		$0	$2,700
Subtotal Structures				$9,700			$0		$0	$2,700
E. BAER Evaluation										
implementation OH	day	10,000	25	$250,000			$0		$0	$250,000
imp. Camp (if need)	day	60,000	15	$900,000						$900,000
Subtotal BAER				$1,150,000						
G. Monitoring Cost							$0		$0	$0
weed survey	day	400	15	$6,000						
storm patrols	day	1000	20	$20,000						
archeology sites	day	400	10	$4,000						
Subtotal monitoring				$30,000						
H. Totals				**$11,157,800**			**#REF!**		**#REF!**	**#REF!**

PART VII - APPROVALS

1.

Forest Supervisor (signature) Date

2.

Regional Forester (signature) Date