Date of Report: 05/01/2003

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[**X**] 1. Funding request for estimated WFSU-SULT funds
[ ] 2. Accomplishment Report to date
[ ] 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
[**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: Cave Gulch Fire

B. Fire Number: MT-HNF-027

C. State: MT

D. County: Lewis and Clark

E. Region: R1

F. Forest: Helena NF

G. District: Helena

H. Date Fire Started: 7/23/00

I. Date Fire Controlled: 10/15/00 (estimated)
Date Fire Contained: 9/15/00 (estimated)

J. Suppression Cost: $18,500,000 as of 9/14/00

K. Fire Suppression Damages Repaired with Suppression Funds (to date)
1. Fireline waterbarred (miles): 15
2. Fireline seeded (miles): 15
3. Other (identify): 0.0

L. Watershed Number: 100301011401

M. Total Acres Burned: 29,187

NFS Acres(27,659) Other Federal (317) State (105) Private (1,106)

N. Vegetation Types: Primary vegetation habitat types include low elevation grasslands/shrublands, Douglas-fir/snowberry, Douglas-fir/common juniper or bearberry, Douglas-fir/ninebark, Douglas-fir/pinegrass, Douglas-fir/twinflower, Subalpine fir/twinflower and Subalpine fir/grouse whortleberry. The Douglas-fir/snowberry habitat type includes a significant amount of ponderosa pine and Rocky Mountain juniper whereas the Douglas-fir/pinegrass, Douglas-fir/twinflower and Subalpine fir/grouse whortleberry habitat types include a significant amount of lodgepole pine, or, are dominated by lodgepole pine.

O. Dominant Soils: Shallow, moderately deep and deep Sub-groups of Cryoboralfs, Ustochrepts, Cryochrepts, Cryoborolls, Haploborolls and Argiborolls.

P. Geologic Types: Sedimentary and meta-sedimentary limestone and argillites

Q. Miles of Stream Channels by Order or Class: order 1 – 9.4 miles, order 2 – 2.4 miles

R. Transportation System

Trails: 10.2 miles Roads: 3.4 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 9,927 (low); 13,141 (moderate); 900 (high)

B. Water-Repellent Soil (acres): 1,450

C. Soil Erosion Hazard Rating (acres):
10,072 (low); 3,132 (moderate); 15,979 (high)

D. Erosion Potential: 21.2 tons/acre

E. Sediment Potential: 953 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 4

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): .48

F. Design Flow, (cubic feet / second/ square mile): 70

G. Estimated Reduction in Infiltration, (percent): 30

H. Adjusted Design Flow, (cfs per square mile): 35

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency: Cave Gulch wildfire burned much of Cave Gulch watershed on National Forest land in 2000. BAER treatments were implemented in fall 2000 and summer 2001.

Still, there have been at least 4 major episodes of flooding and sedimentation (May and August 2001, August 2002, and March 2003) causing significant damage to downstream private properties in that watershed, as well as affecting National Forest roads and resources. The most recent flooding episode occurred mid-March 2003 when the greater Helena area experienced a record one-day snowfall, and within a week also experienced record high temperatures, causing rapid snowmelt and flood runoff.

Private properties directly affected by flooding and sedimentation in Cave Gulch include residential homes, a trailer park, commercial storage facility, boat repair business, campground, marina, store and restaurant. Flooding has also caused concern for public health in this area, with potential for domestic well contamination by mercury from historic mining in Cave Gulch watershed, and well contamination by other biohazards.

These flooding events have created several large, unstable headcuts in Cave Gulch stream channel, and have completely washed out or eroded deep gullies in segments of Forest Road 4156. This forest road has in places become the lowest point in the valley, and will continue to carry runoff water and erode fine-textured soil in the road bed. Stream headcuts and road gullies have, and will continue to erode and deliver sediment to downstream private properties, unless stabilization treatments are implemented.

Headcut #3

Headcut #4

Gully in Forest Road 4156

B. Emergency Treatment Objectives: The private landowners, downstream of National Forest lands, have partnered with Lewis and Clark County, and NRCS to implement emergency watershed treatment measures on private land before the peak rainy season begins in June this year. Treatments on private lands are being designed to construct a flood conveyance channel through the affected private land area. This flood conveyance channel will route flood flows and sediment away from private home and business structures.

Helena National Forest has deemed it critical to implement watershed stabilization measures upstream, concurrently with work on private lands, to prevent sediment from National Forest lands in damaging private investments in construction of a flood conveyance structure downstream. The objectives of the proposed treatments on National Forest lands are to stabilize headcuts and gullies that have developed during flood events since the wildfire in summer 2000. Stabilizing eroding areas will reduce debris and sediment loading onto the private lands below the National Forest. There is a need for an accelerated timeline to implement work on National Forest lands, to protect investments in restoration work on private lands. We estimate this project will cost about $117,672 to implement on NF lands.

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

Land 100 % Channel 90 % Roads 90 % Other % n/a

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	90	95
Channel	80	90	95
Roads	80	90	95
Other			

E. Cost of No-Action (Including Loss): $ 260,000

F. Cost of Selected Alternative (Including Loss): $ 117,672

G. Skills Represented on Burned-Area Survey Team:

[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	

Team Leader: Rudy Tantare Townsend R.D.

Email: BAER contact: bstuart@fs.fed.us Phone: 406-449-5201 (ex. 245)
FAX: 406-449-5436

H. **Treatment Narrative:**

Road Treatments: Reshape 900 feet of gullied road and armor with class II riprap. The objective of this treatment is to prevent further road downcutting, minimize sediment delivery to the stream and reduce sediment transport to restoration treatments being implemented on private properties downstream.

Channel Treatments: Construct 4 stream headcut stabilization structures in lower Cave Gulch with class IV rip rap. Headcut structures will be four to six feet in height, and constructed with wings to prevent stream avulsions from going around the structures. Structures will be keyed at the top and the bottom. Grade control structures will require dewatering of stream during construction.

Check dams constructed of logs will be installed on first order tributaries higher in the drainage where gully erosion has occurred following the fire. We estimate a need for 25 structures.

Accomplishments to date: All other treatments as in the original requests have been accomplished to date. These treatments have included seeding, straw wattles, and straw mulching. We are currently implementing conifer planting in the upper watershed as part of the post-fire restoration efforts.

I. Monitoring Narrative:

USGS is currently monitoring Cave Gulch. They have installed two rain gages and are taking indirect measurements of flood flows. USGS monitoring has helped make flood flow designs more accurate.

Private citizens downstream will be monitoring the effectiveness of our treatments to stabilize eroding areas on National Forest lands, and thus reduce sediment delivery into constructed flood conveyance structures designed to protect their properties. They will be quick to call if these treatments are not effective, and sediment deposition impairs the planned flood conveyance structure and continues to damage their properties.

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

Line Items	Units	Cost	Units	SULT $	$		units	$	Units	$	$
A. Land Treatments											
none		$0	0	$0				$0		$0	$0
				$0				$0		$0	$0
								$0		$0	
								$0		$0	
Subtotal Land Treatments				$0				$0		$0	$0
B. Channel Treatments											
headcut stabilization	struc-tures	$13,168	4	$52,672				$52,672		$0	
								$0		$0	
								$0		$0	
Subtotal Channel Treat.				$52,672				$52,672		$0	
C. Road and Trails											
gully stabilization	feet	$66	900	$59,400				$59,400		$0	
								$0		$0	
								$0		$0	
								$0		$0	
Subtotal Road & Trails				$59,400				$59,400		$0	
D. Structures											
check dams	each	$224	25	$5,600				$5,600		$0	
								$0		$0	
								$0		$0	
Subtotal Structures				$5,600				$5,600		$0	
E. BAER Evaluation											
								$0		$0	
								$0		$0	
G. Monitoring Cost								$0		$0	
H. Totals				**$117,672**				**$117,672**		**$0**	**$117,672**

PART VII - APPROVALS

1. /s/ Allen L. Christophersen — May 1, 2003
   Allen L. Christophersen — Date
   Acting Forest Supervisor (signature)

2. _____ _____
   Bradley E. Powell — Date
   Regional Forester (signature)