USDA-FOREST SERVICE FS-2500-8 (7/00)
Date of Report: July 22, 2005

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
[ ] 3. No Treatment Recommendation

B. Type of Action

[**X**] 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 DESCRIPTION

A. Fire Name: **Ricco**

B. Fire Number: **P2BZV2**

C. State: **South Dakota**

D. County: **Meade**

E. Region: **02**

F. Forest: **Black Hills**

G. District: **Northern Hills**

H. Date Fire Started: **July 8, 2005**

I. Date Fire Contained: **July 17, 2005 @ 1700**

J. Suppression Cost: **$3,300,000 as of July 21, 2005**

K. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline rehabilitated (miles): **All firelines, cat and hand have been rehabilitated. 3.3 miles of road were used along with 4.5 miles of catline, and an unknown amount of handline.**
2. Fireline seeded (miles): **Recommended to seed all cat lines and safety zones**
3. Other (identify):

L. Watershed Number: **101201110201 & 101201110202**

M. Total Acres Burned:
NFS Acres (**3,613**) Other Federal ( ) State ( ) Private (**346**)

N. Vegetation Types: **Ponderosa Pine (95%), Grass (5%)**

O. Dominant Soils: **Various comprised of combinations of Vanocker, Citadel and Pausaugunt**.

P. Geologic Types**: Two-thirds Madison Limestone and one-third Minnelusa Formation**

Q. Miles of Drainage (Stream) Channels by Order or Class:
Order 1: **9.0** Order 2: **0.5** Order 3: **4.7**

R. Transportation System
Trails: 0 miles Roads: **11 miles system roads, 5.4 miles non-system roads, numerous ATV trails**

PART III - WATERSHED CONDITION

A. Burn Severity (acres):			
	2,981 (low)	**810** (moderate)	**0** (high)
Forest Service	**2,747** (low)	**744** (moderate)	**0** (high)
Private	**234** (low)	**66** (moderate)	**0** (high)

B. Water-Repellent Soil (acres):	**210**
Forest Service	**186**
Private	**24**

C. Soil Erosion Hazard Rating (acres):
28 (low) **0** (moderate) **3,931** (high)

D. Erosion Potential: **60 tons/acre**

E. Sediment Potential: **1550 cubic yards/square mile**

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): **3-5**

B. Design Chance of Success, (percent): **75**

C. Equivalent Design Recurrence Interval, (years): **10**

D. Design Storm Duration, (hours): **1**

E. Design Storm Magnitude, (inches): **1.86**

F. Design Flow, (cubic feet / second/ square mile): **119**

G. Estimated Reduction in Infiltration, (percent): **33**

H. Adjusted Design Flow, (cfs per square mile): **380**

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:
Threats to Life and Property
Field reviews within the burned area and downstream of the burned area confirm that threats to life are unlikely except in the occurrence of an unusual flood-producing storm. Threats to property are somewhat likely. There are several homes and outbuildings that are located in or near the floodplain or alluvial fans. The impacts will generally be wet foundations and ash and sediment deposits in the yards

or on roads. The town of Piedmont will have water, ash and sediment sheeting into town. There is one Forest Service culvert that was plugged and one driveway across Little Elk Creek with small culverts that may not handle the water flow.

Threats to Long-term Soil Productivity and Ecosystem Integrity

Field reviews indicate potential threats to long-term soil productivity and ecosystem integrity. Observations from this and other fires suggest that there will likely be an increase in noxious weed infestations from Canada thistle, scotch thistle, burdock, hound's tongue and mullein. All burned areas, especially the moderate burn severity, invaded by noxious weeds will cause a decline in soil quality and productivity. Degradation of soil quality generally leads to increased erosion rates and sediment yield, causing further impacts to soil productivity.

Maintaining soil quality is necessary for long-term soil productivity and ecosystem integrity. Key soil quality factors include infiltration, absorptivity, water holding capacity, ion exchange capacity, carbon and nitrogen cycling and soil food web status.

Threats to Water Quality

Water quality is of concern if sediment and ash are delivered downstream. Most of the streams in the immediate area are not perennial. Little Elk has sections that are perennial but they are generally upstream of the fire. The fire will drain into Elk Creek, which should be an intermittent stream. There are no perennial streams that will be affected in the immediate vicinity.

B. Emergency Treatment Objectives:

- **To reduce runoff from the burned areas in the Little Elk Drainage, Chimney Canyon and Priest Canyon.**
- **To reduce erosion and sedimentation from burned areas.**
- **To protect crews and the public working and traveling along the roads by removing hazard trees.**
- **To reduce concentration of water and subsequent erosion on one Forest System road.**
- **To prevent expansion of noxious weeds in the burned area.**
- **To warn the public of impending flood.**

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

Land **80%** Channel --% Roads **90%** Other --%

D. Probability of Treatment Success

Years after Treatment

	1	3	5
Land	**70**	**80**	**90**
Channel	--	--	--
Roads	**100**	**100**	**100**
Other	--	--	--

E. Cost of No-Action (Including Loss): $**315,000**

F. Cost of Selected Alternative (Including Loss): $**290,330**

G. Skills Represented on Burned-Area Survey Team:

[**X**] Hydrology [ ] Soils [ ] Geology [ ] Range [ ]
[**X**] Forestry [**X**] Wildlife [ ] Fire Mgmt. [ ] Engineering [ ]
[ ] Contracting [ ] Ecology [**X**] Botany [**X**] Archaeology [ ]
[ ] Fisheries [ ] Research [ ] Landscape Arch [**X**] 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:
Aerial Seeding
Method
Seeding should reduce the amount of time needed to reestablish protective ground cover, which will reduce erosion and flooding potential. Moderate soil severity burned slopes on the National Forest will be seeded to reduce the ability for noxious weeds to become established. Seed source from noxious weeds is primarily on private land. The seed mixture for the Northern Hills Ranger District will be used at a rate of 20 pounds per acre minus the purple prairie clover.

Common Name	Scientific Name	PLS Pounds/Acre
Annual Rye	**Lolium multiflorum**	**6**
Slender Wheatgrass	**Elymus trackycaulus**	**5**
Canada Wildrye	**Elymus Canadensis**	**2**
Canby Bluegrass	**Poa canbyi**	**2**
Green Needlegrass	**Nassella viridula**	**5**

Objective
The objective of this treatment is to establish vegetation as quick as possible to reduce erosion and prevent or minimize the establishment of noxious weeds.

Aerial Mulching
Method
Apply straw mulch by helicopter to provide organic ground cover. Goal is to obtain 80% ground cover over the area applying mulch at a rate of 1 ton per acre.

Objective
The objective is to get an organic ground cover on areas identified to have high erosion. Two hundred acres were identified from the erosion model. This will reduce erosion and runoff from the mulched sites and lessen the impacts of flooding down canyon.

Hazard Tree Removal
Method
Obvious hazard trees will be removed along all open roads within the burned areas. About 150 hazard trees occur.

Objective
This treatment reduces the chance for damage to life and property by reducing the risk of trees falling on Forest Service employees or the public.

Hazard Tree Assessment
Method
A hazard tree assessment will be conducted along the Stagebarn Canyon Road, where the fire burned into the canyon. This will determine further needs.

Objective
This will identify further treatment needs to reduce the risk of trees falling on the public or Forest Service employees. The Stagebarn Canyon Road is used by the public to access Stagebarn Caverns, a private tourist attraction.

Early Warning Precipitation Gage
Method
Install an automated rain gage and Data Collection Platform (DCP) with GOES telemetry within the burn area in Chimney Canyon. The rain gage will be installed and operated by the USGS.

Objective
The rain gage will augment the existing telemetry rain gage system in South Dakota which provides data to the National Weather Service. The gage will be very useful in allowing the National Weather Service to forecast flood events originating in the burned area. The gage will enhance warning/watch/forecast capability of the National Weather Service and Meade County Emergency Services to evacuate the area when flood hazards are imminent.

Channel Treatments:
None

Roads and Trail Treatments:
Culvert Replacement
Method
One culvert that is plugged has been identified in the fire area and is in need of replacement.

Objective
With the burned area above the culvert, increased runoff is expected. Replacement of the culvert is necessary because the road at the crossing will fail. This treatment will fix the problem.

Standard Grade Dips
Method
Grade dip will be designed and built to drain water off of the road and still allow for motorized vehicle travel. The dips are typically skewed 30 degrees. These dips are in addition to existing grade dips and are designed to handle increased runoff by dispersing the flows quickly. An estimated 5 dips are required.

Objective
This treatment will drain water from the road surface to prevent damage to the road from increased runoff.

Close ATV Trail/Non-System Roads
Method
Close all user-created ATV trails and non-system roads to protect resources and for safety reasons due to hazard trees. Closure method shall include blocking the beginning of the trail with large partially buried rocks, scarifying the beginning of the trail and falling trees over the trail for the entire length. Where the trail has a potential for erosion, install native log water bars or earthen rolling dips. In addition, gates and fences may be needed in some areas.

Objective
User-created ATV trails and non-system roads exist throughout the fire perimeter and in some cases, the trails go straight up steep hills. Additional runoff created by the fire will cause erosion to these trails and damage adjacent down-slope resources. This treatment will drain water from these trails and roads to prevent erosion and concentrated water flows that would be generated by the user made trails.

Safety Sign
Method
Warning sign to be installed in Stagebarn Canyon.

Objective
This treatment will provide warning about the flooding potential to people driving Stagebarn Canyon Road.

Structures:
None

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.)

Noxious Weed Monitoring
The purpose of this monitoring is to monitor areas near existing weed infestations to determine if the spread of noxious weeds is occurring. Current infestations were observed on adjacent private land. Monitor areas for up to three years for presence and persistence of invasive species.

Monitoring will be conducted from August through mid-October in 2005 and mid-May through mid-October of 2006 and 2007.

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

Line Items	Units	Unit Cost	# of Units	WFSU SULT $	Other $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
Aerial Seeding	acres	100	660	$66,000	$0		$0		$0	$66,000
Aerial Mulching	acres	700	200	$140,000	$0		$0		$0	$140,000
Hazard Tree Removal	each	10	150	$1,500	$0		$0		$0	$1,500
Hazard Tree Assmt	each	500	1	$500	$0		$0		$0	$500
Early wrng pcp gage	each	16100	1	$16,100	$0		$0		$0	$16,100
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$224,100	$0		$0		$0	$224,100
B. Channel Treatments										
				$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										
Culvert Replacement	each	2000	1	$2,000	$0		$0		$0	$2,000
Standard Grade Dips	each	200	5	$1,000	$0		$0		$0	$1,000
Close ATV Trails	miles	3000	10	$30,000	$0		$0		$0	$30,000
Safety Sign	each	450	1	$450	$0		$0		$0	$450
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$33,450	$0		$0		$0	$33,450
D. Structures										
				$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	each	25100	1	$25,100	$0		$0		$0	$25,100
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Evaluation				$25,100	$0		$0		$0	$25,100
F. Monitoring										
Weeds	acres	8	160	$1,280	$0		$0		$0	$1,280
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$1,280	$0		$0		$0	$1,280
G. Totals				**$283,930**	**$0**		**$0**		**$0**	**$283,930**

PART VII - APPROVALS

1. */s/ Brad Exton (for)* July 22, 2005
   Forest Supervisor (signature) Date

2. _____ _____
   Regional Forester (signature) Date