

Date of Report: September 16, 2005

**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 DESCRIPTION**A. Fire Name: ProspectB. Fire Number: MT LNF 539C. State: MontanaD. County: MineralE. Region: NorthernF. Forest: LoloG. District: SuperiorH. Date Fire Started: August 8, 2005I. Date Fire Contained: August 30, 2005J. Suppression Cost: \$7 million

## K. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): 3.5 miles of dozer line, 20 miles of handline
2. Fireline seeded (miles): 3.5 miles of dozer line
3. Other (identify): 3 acres of safety zones and helispots rehabed and seeded; 1.5 miles of over-widened trail returned to single-track.

L. Watershed Number: 170102040607, 170102040608M. Total Acres Burned: 3,211

NFS Acres( 3,211)    Other Federal ( )    State ( )    Private ( )

N. Vegetation Types: The Prospect Fire burned primarily along ridgetops and generally northeasterly facing slopes at elevations from 3,500 to 6,000 feet. Conditions are cool and moist to somewhat dry depending on the sub-aspect of the site. Subalpine fir and Douglas-fir are common but grand fir, western larch and lodgepole pine are also well represented.

O. Dominant Soils: The dominant soils in the burned area are underlain by weakly weathered to moderately weathered Precambrian metasedimentary rocks known as the Belt Supergroup. In general, these would not be considered "sensitive soils". These soils are considered well drained with medium to coarse textures; rock fragments throughout the soil profile are common. On ridgetops and in glacial cirque basins the soils are shallow butt deep to moderately deep on on sideslopes. Most soils have a volcanic ash surface layer with silt loam texture.

P. Geologic Types: Within the burned area, the geologic parent material is the Precambrian metasedimentary Belt Supergroup or "hard belts". Major landforms consist mostly of moderately steep mountain slopes but range from broad convex ridges to glacial cirque basins and some steep breaklands with slopes greater than 65 percent.

Q. Miles of Stream Channels by Order or Class: Order 1: 1.7 miles, Order 2: 1.1 miles, Order 3: 0.4 miles

R. Transportation System

Trails: 1.2 miles      Roads: 9.7 miles

### **PART III - WATERSHED CONDITION**

A. Burn Severity (acres): 1,443 (low) 1,165 (moderate) 612 (high)

B. Water-Repellent Soil (acres): 116

C. Soil Erosion Hazard Rating (acres):  
2,707 (low) 437 (moderate) 67 (high)

D. Erosion Potential: 21 tons/acre

E. Sediment Potential: 230 cubic yards / square mile

### **PART IV - HYDROLOGIC DESIGN FACTORS**

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

B. Design Chance of Success, (percent): 85

C. Equivalent Design Recurrence Interval, (years): 5

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 1

F. Design Flow, (cubic feet / second/ square mile): 35 - 65

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

H. Adjusted Design Flow, (cfs per square mile): 45 - 65

## **PART V - SUMMARY OF ANALYSIS**

### **A. Describe Watershed Emergency:**

The Prospect Fire burned in a mosaic pattern through the headwaters of several second and third order tributaries of Trout Creek. Trout Creek is on the State of Montana's non-attainment 303(d) list for sediment. The largest extent of severe burning was in the headwaters of Deep Creek, the origin of the fire, in a block of about 700 acres. In total 1,157 acres of this watershed burned (39 percent); an additional 300 acres also burned in the Landowner Fire of 2000. Outside of the burned area about 500 acres of past timber harvest have occurred and historic mining activities have left some sites vulnerable to erosion. This harvest, the five year old Landowner Fire, and the Prospect Fire have resulted in creating a cumulative "equivalent clearcut condition" of about 50 percent in the Deep Creek watershed. The high potential for post-fire runoff increases from the burned area on top of existing water yield increases constitutes the watershed emergency.

Deep creek is a tributary to Trout Creek, an important fishery stream in the Middle Clark Fork River. The Inland Native Fish Strategy (INFISH), listed Trout Creek and its tributaries as a Priority Watershed. The US Fish and Wildlife Service recently listed Trout Creek as Proposed Bull Trout Critical Habitat. Deep Creek itself currently supports a population of genetically pure westslope cutthroat trout.

Culvert surveys in Deep Creek determined that there are two road crossings of Deep Creek that act as upstream passage barriers to fish, constrict the bankful channel by 50 percent and would fail to safely pass a 100 year flow. The upper culvert on NFSR 16937 is a 6ft. by 3 ft. arch pipe that is 47 feet long under about 4 feet of fill. Approximately 125 cubic yards of sediment from the road fill plus considerable deposition of sediment stored behind the fill would be added to the stream should this culvert fail.

The lower road crossing of NFSR No. 250 (the Trout Creek Road) is a six foot diameter round pipe that is fifty feet long. The 50 percent channel constriction causes such an increase in water velocity that the streambed below the culvert outlet has eroded more than five feet. The eight feet of road fill above the culvert puts about 250 cubic yards of potential sediment at risk in a high runoff event. Deposited alluvium upstream from this inlet controlled culvert may more than double this volume should the road fill wash out.

Discharge calculations based on culvert dimensions and channel slope indicate the culvert has a maximum capacity of 140 cubic feet per second (cfs) at a headwater-to-depth ratio of 1.0. Discharge calculations based on US Geological Survey regional data suggest this flow capacity would be exceeded by a 20 to 25 year return period event. Existing INFISH and BMP standards require designing structures to accommodate a 100 year event, which in this case would be about 300 cfs. Under present post fire conditions a design rainstorm of 1 inch per hour is estimated to produce a peakflow at the existing culvert of 170 to 200 cfs.

Physical indicators at the site suggest that water has regularly pooled above the inlet (a rust-line of 2/3 the diameter in height, bank erosion filets along the sides of the inlet and the huge outlet scour pool). The height and mass of the fill have served to dam the stream and preclude over-topping. The calculated post-fire runoff increases further increase the risk of failure.

The Trout Creek road cannot be closed as it provides access to popular summer and winter recreation areas, over the divide access to the Kelly Creek area of Idaho, to a major stateline winter recreation area, and two SNOTEL Site accessed by the NRCS.

### **B. Emergency Treatment Objectives:**

The recommended treatment is the replacement of the two culverts on Deep Creek which have insufficient capacity to safely pass calculated post-fire runoff. Timely completion of this treatment will mitigate the potential water quality and channel impacts of culvert failure caused by post-fire runoff increases. The recommended treatment will also prevent the loss of access created by a potentially large road failure and the economic loss related to administrative use, timber haul, general summer and winter recreation use and outfitter hunting businesses. In accordance with Regional Policy, fish passage will be

accommodated in the new installations (12-4-03 letter from the Regional Forester, "*Guidance for Aquatic Organism Passage*").

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

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

D. Probability of Treatment Success

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

E. Cost of No-Action (Including Loss):\_ \$1,782,390 (based on cost/risk worksheet)

F. Cost of Selected Alternative (Including Loss):\_ \$341,239

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input type="checkbox"/> Range	<input type="checkbox"/>
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input type="checkbox"/>
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> 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: None Recommended (if year one monitoring indicates recovery is not taking place (as was anticipated by the BAER team, an interim request may be submitted).

Channel Treatments: None Recommended

Roads and Trail Treatments: None Recommended

Structures: While close to 10 miles of road are within the Prospect Fire perimeter, they are for the most part located in areas of low-to-moderate burn severity. No treatments are felt necessary nor recommended to the existing road system in those areas. The largest contiguous area of severe burning in the Prospect Fire is concentrated in the headwaters of Deep Creek. Calculated post-fire peak flows would not be accommodated by the two existing culverts on Deep Creek; one on NFSR No. 16937 and one on NFSR No. 250.

The existing culvert on NFSR No. 250 is a 6 foot diameter round pipe 50 feet long (see additional information in "Watershed Emergency" section). This culvert will be replaced by a structural plate arch 16 feet wide by 5.25 feet high. The culvert on NFSR 16937 is a 6ft. by 3 ft. arch pipe that is 47 feet long. The recommended replacement for this culvert is also a structural plate arch of the same dimensions.

**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.)

(1.) **Monitor Stream Discharge and Channel Adjustment in Deep Creek:** After the recommended culvert replacements, annual peak discharge levels will be calculated using current meter calibrated "crest ages". These gages would be assembled on-forest from easily purchased local materials and installed this Fall. The gages would be calibrated by concurrent weekly current meter measurements of stream discharge. After culvert replacement and prior to the period of peak runoff, the channel profile and several cross-sections will be surveyed to establish a baseline configuration ¼ mile upstream and downstream of each culvert. These measurements will be repeated after peak flow. This pattern of measurements will continue for three years to assess the effectiveness of the culvert replacements at accomodating flows without impacting channel stability or fish habitat quality. The information gathered in year one will also indicate the need for additional watershed stabalization treatments. The cost of this item would be 36 person-days for data collection, reduction and reporting at \$5,000 plus \$500 for materials and supplies. Estimated total cos is \$5,500.

(2.) **Monitor Costs and Accomplishment Schedule of Recommended Treatment:** Using monthly financial transaction records, time sheets, project notes and other accounting records, expenditures and accomplishments will be updated and tracked on a monthly basis. Tracking spreadsheets will be maintained and a completion report prepared. The estimated cost of this item is is 25 work-days at \$3,500.

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

[illegible]

## **PART VII - APPROVALS**

1. /s/ **Barbara K. Beckes** for  
Forest Supervisor (signature)

09-20-2005  
Date

2. \_\_\_\_\_  
Regional Forester (signature)

Date \_\_\_\_\_