

Date of Report: 09-19-07, Amended 10/10/07**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)  
**Assessed through September 16, 2007**
- ☒ 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: **2007 -BOB MARSHALL FIRE COMPLEX includes four suppression fires**

B. Fire Number: Fool Creek MT-LCF-009, Corporal Creek MT-FNF-070, Railey Mtn. MT-FNF-027, and Calbick MT-FNF-076.

C. State: Montana

D. County: Flathead

E. Region: 01

F. Forest: Flathead

G. District: Spotted Bear

H. Dates the Fires Started: Fool Creek 7/4/07, Railley Mtn 7/21/07, Corporal 8/12/07, Calbick 8/15/07

I. Date Fires Contained: Unknown

J. Suppression Cost: (as of 9/16/07) Fool Creek \$5,997,916, Corporal \$143,000, Railey Mtn. \$149,000 and Calbick Creek \$127,000. (Total -\$6,416,916)

K. Fire Suppression Damages Repaired with Suppression Funds - **This information was not available at this time.**

Watershed Number: (Fifth code HUC's) **Fool Creek Fire: 1701020701; Corporal Creek: 1701020904, 1701020905; Railley Mtn.: 1701020901; and Calbick Creek: 1701020701**

M. Total Acres Burned: Fool Creek Acres (58,134) Flathead NF portion (27,986) Other/Private (0)  
Corporal Creek NFS Acres (13,258) Other/Private (0)  
Railey Mtn. NFS Acres (21,324) Flathead NF portion (17,466) Other/Private (0)  
Calbick Creek NFS Acres (1,011) Other/Private (0)  
TOTAL Burn Acres Flathead NF – 59,721

N. Vegetation Types: Predominantly Douglas-fir, Lodgepole Pine, Ponderosa Pine, and Subalpine fir forest cover-types, with small areas grassland.

O. Dominant Soils: Dominantly Eutroboralfs, Cryoboralfs, Cryochrepts, with small areas of Udifluvents and Cryants.

P. Geologic Types: Precambrian meta-sedimentary; predominantly argillites, siltites, quartzites, or limestones. Also some Paleozoic Limestones.

Q. Approximate Miles of Stream Channels :

Fire	Perennial Stream (miles)	Intermittent Streams (miles)	Total Stream length (miles)
Fool Creek	58.7	35.5	94.2
Corporal Creek	13.9	23.1	37.0
Railey Mtn.	30.7	21.4	52.1
Calbick Creek	1.6	-	1.6

R. Transportation System: F.S. Trails: 57.9 miles in fire areas

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

A. Burn Severity: (acres): 14,930 (25%-low) 23,888 (40%-moderate) 11,944 (20%-high)

B. Water-Repellent Soil (acres): 21,499

C. Soil Erosion Hazard Rating (acres): 22,530 (low) 20,662 (moderate) 16,529 (high)

D. Erosion Potential: 20.8 tons/acre (average) (range .5 to 31.2 tons/acre)

E. Sediment Potential: 9,370 cubic yards / square mile

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

A. Estimated Vegetative Recovery Period, (years): 2

B. Design Chance of Success, (percent): 80

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

D. Design Storm Duration, (hours): NA

E. Design Storm Magnitude, (inches): NA

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

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

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

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

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

- Water Quality, Fisheries, and Aquatics, both within the fire area and downstream.

The soil burn severity was not mapped out for the entire area of the wilderness fire; however based upon the over-flight of the fire approximately 20% of the fire area burned with high soil burn severity. Approximately 40% of the fire area burned with a moderate burn severity, the remainder was low or unburned. All the surface soils in the fire area have a volcanic ash influenced surface layer. Volcanic ash soils typically are naturally slightly to moderately hydrophobic (water-repellent) when they are become dry. The soils in the Flathead Basin were very dry prior to the start of the 2007 wildfires and when burned-over were dried out even more. Field observations of showed the post-fire hydrophobic conditions moderate on the unburned and low soil burn severity sites. The moderate and high soil burn severity sites were highly hydrophobic in the upper ¼ inch and moderately hydrophobic under that surface layer.

The hydrophobic condition caused by the drying effect of the fire of this type of soils tends to lessen within 2 to 3 weeks of high humidity/dew events or a short duration, low intensity rain event in which the soil surface layers can be slow wetted. The amount of re-wetting needed depends on the dryness of the surface soil. Similar soils in the Chippy Creek Fire were observed not to be hydrophobic where a low intensity rain shower had occurred last week; areas where the rain shower did not occur exhibited hydrophobic characteristics. However if an intense rainstorm were to occur over the fire area before the hydrophobic soil conditions recovered potentially significant erosion could be expected from some of the moderate burn severity and the high burn severity sites. The modeled potential post-fire soil erosion (WEPP model), and recently observed post-fire erosion events, revealed that potentially more than 30 tons per acre of soil loss could occur.

Typical late summer early fall precipitation events do not have high intensity rainstorms that occur during the summer associated with thunderstorms. The expected scenario post-fire responses in most watersheds that have a significant percentage of their area in moderate or high burn severity would likely be: (1) an initial flush of wood ash into the creeks; (2) to some extent minor areas of rill and some small gully erosion in the ephemeral drainages on the steep valley walls with the high burn severity. Many areas within the fires have down woody debris on the hill-slopes, which are effective natural sediment traps to capture sediment (eroded soil) prior to deposition into a stream channel. Based upon past observations of the amelioration of the soil hydrophobic conditions, the natural revegetation, and the low probability of significant soil erosion/sediment delivery event occurring, there was no general seeding of the hillslopes, or other hill-slope erosion control treatments recommended for the moderate or high soil burn severity areas. Sources of potential post-fire sediment increase from the trail system were identified as sites where effective sediment reduction treatments should be implemented.

The potential post-fire sediment increases are a concern due the fisheries resource in the area of the wildfires. Bull trout is listed as threatened under the Endangered Species Act. Fool Creek Fire area has spawning habitat for Bull trout in Bowl Creek, Strawberry Creek, Trail Creek, and Basin Creek. In the Railley Mtn. Fire area Bull Trout spawn in the entire burned length of Young's Creek and Babcock Creek. Bull trout do not occupy the streams within the Corporal Fire area, but spawn in the Spotted Bear River less than a mile downstream of the fire boundary. Increased sediment loads to any of the streams with spawning habitat can have a negative impact on the Bull trout population in the South Fork of the Flathead River.

Westslope cutthroat trout, is considered a sensitive species in Region 1. Populations of Westslope cutthroat trout are found in the stream in the Corporal Fire (Silvertip, Corporal, and Harrison Creeks), Fool Creek Fire (Gateway Creek), Railley mtn. Fire ( Young's Creek and Jenny Creek).

Increased sediment loads post-fire are can impact spawning and rearing habitat quality.

Accelerated erosion is of particular concern on system trails within areas of high and moderate burn severity. Many of these trail segments are located in close proximity to stream channels, and there is a high probability of sediment delivery. Several turnpike logs were burned by the fire, leaving exposed soil vulnerable to erosion and transport to streams. More detailed information about the system trails is located in the *Threats to Life and Property* section of this report.

- Threats to Long-term Soil Productivity and Ecosystem Integrity

The trails in the burn area provide a natural avenue of ingress to a host of noxious weed species that are currently found in and surrounding the Bob Marshall Wilderness Area. Weed spread in the wilderness has the potential to reduce native plant diversity, allow for soil erosion, and damage wildlife habitat. Weeds may increase dramatically within the fire area, especially along trails and where fire suppression activities disturbed the existing weed seed bank and opened uninfested lands to invasion by adjacent weed populations.

Those weed species of greatest concern include spotted knapweed (*Centaurea maculosa*), St. Johnswort/Goatweed (*Hypericum perforatum*), Orange hawkweed (*Hieracium aurantiacum*) and Canada thistle (*Cirsium arvense*) and common tansy (*Tanacetum vulgare*). All are Montana State and Flathead County listed noxious weed species. Tansy ragwort (*Senecio jacobaea*) has been located in areas of the Flathead National Forest. The Kootenai and Flathead National Forests have spent millions of dollars trying to control tansy that was introduced into Northwestern Montana by the Little Wolf Fire in 1994.

In wilderness areas, noxious weeds pose a special problem because they are difficult to find, treat, or access. Transporting chemicals into the backcountry presents a high risk for spilling, and spraying pristine landscapes with herbicides is unpalatable to the public. Control of weeds in the wilderness is also much more costly than in the front country because of the difficulty of accessing and treating remote sites, especially in rugged terrain. Therefore, monitoring and treating weeds immediately while populations are small is paramount in wilderness areas.

- Threats to Life and Property

In general the system trails within the burned area of the Bob Marshall Wilderness Area were in good condition prior to the wildfire. An aerial reconnaissance survey (helicopter flight by the soil scientist) was completed to assess burn severity on the system trails in the burn area. The information from the aerial survey in concert with field reviews of some of the trail segments by the district resource personnel, were used to develop the trail safety and post-fire damage assessment. That survey information, interpretations, and estimates of needed work were used to develop specifications in this report.

Attached are the burn severity maps for the system trails within the suppression fires in the Bob Marshall Wilderness Area. See the following table for the summary of the burn severity associated with trails in these fires. Note that there is 3.15 miles of trail that are in the Fool Creek Fire Area that are not included in this table, but were identified on the burn severity map, because those trail segments were in the Wildland Fire Use portion of the Fool Creek Fire. The portions of Trails #116 and #378 in the Wildland Fire Use area were not included in any of the BAER treatment calculations due to policy even though post-fire erosion control treatments are needed.

Soil Burn Severity Class Associated with System Trails	Fool Creek Fire	Railley Mtn. Fire	Corporal Fire	Calbick Fire	Total Miles of Trail by Soil Burn Severity
Unburned	.6	.2	1.6	.8	3.2
Low Burn Severity	8.7	9.5	4.5	0	22.7
Moderate Burn Severity	13.3	9.4	2.3	.3	25.3

High Burn Severity	6.7	3.6	1.0	0	11.3
<b>Total Miles</b>	29.3	22.7	9.4	1.1	62.5 (all fires)
Percent Total Trail Miles of High & Moderate Severity	54%	36%	9%	1%	

Many miles of these trails occur on steep side slopes that are susceptible to erosion events during normal runoff years. A large fire event makes the trails system susceptible to major soil erosion (rilling and/or gullyng) during the upcoming fall and spring runoff events. The increased post-fire runoff will increase the risk to stream sedimentation, and public safety within the fire area. The existing system trails within the Bob Marshall Fire Complex have numerous stream crossings and waterbars that have been affected by the fire. Many of the waterbars constructed from wood have burned and are no longer effective. Some culverts need cleaning and/or replacement to insure unobstructed flows. In some areas the trails have burned away portions of the tread or are very susceptible to soil erosion/raveling that make the trails very unsafe for use by the public. The purpose of this proposed treatment work is to decrease the risk of post-fire soil erosion from the additional water flows on the trails and hill-slopes. To insure surface water flows are diverted off the trails preventing washouts, and to maintain trails that are safe for public use.

Of the trails located in close proximity to stream channels (riparian areas) there were several miles that burned with moderate and/or high soil burn severity. The primary post-fire risk associated with these riparian areas is how the fire partially or totally consumed the turnpike logs (which support turnpike the materials), effectively causing the breakdown/degradation of the turnpike trail segments. The turnpike segments are installed to reduce soil erosion/sedimentation, and provide for public safety on wet trail segments usually occurring on stream floodplains. The breakdown of these turnpike sections poses both a public safety hazard and degradation of water quality due to the direct sedimentation sources to stream channels. Several of the affected riparian areas with burned-out turnpike segments are associated with Bull trout and West-slope cutthroat trout habitat. The proposed treatment would be to repair of approximately 2500 feet of the turnpike trail segments in the high burn severity areas of Fool Creek, Railley Mtn., and Corporal Creek.

There is a high density of hazard trees associated with this fire due to the intensity of the fire and the dryness of the trees prior to the fire. Many trees have the roots burned out and are very susceptible to tip-over. This poses a safety hazard to both the public and the Forest Service crews working on post-fire treatment projects.

#### B. Emergency Treatment Objectives:

Land Treatments – The objective of weed treatment and detection is to reduce weed expansion by ground-treatment and early detection along trails and areas having known presence.

Trail Treatments – The objective of the trail erosion control treatments are to minimize fire effects on water quality and fisheries habitat by reducing the amount of sediment delivered to streams from the fire-impacted system trails. The hazard warning signing and hazard tree treatment is to provide for public and Forest Service employee health and safety.

Since these fire are in a wilderness area, only trees presenting a clear and present danger will be removed.

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

Land **80** % Channel **NA** % Trails **80** % Other **NA** %

#### D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
<b>Trails</b>			
Erosion Control	90	90	90
Hazard Tree Removal	95	85	75
Hazard Signing	100	100	100
<b>Land</b>			
Weed Monitoring	90	80	80

E. Cost of No-Action (Including Loss): **See attached cost-risk analysis document.**

F. Cost of Selected Alternative (Including Loss): **See attached cost-risk analysis document.**

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"/> NEPA Coordinator
<input checked="" type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input type="checkbox"/> Engineering	<input checked="" type="checkbox"/> Recreation/Trails
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input type="checkbox"/> Archaeology	<input type="checkbox"/>
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

Team Leader: Dean Sirucek, Hydrologist, Flathead National Forest

Email: dsirucek@fs.fed.us

Phone: 406-387-3817

H. **Treatment Narrative:**

#### LAND TREATMENTS:

*Noxious Weed Monitoring:* Known and high potential noxious weed infestation sites within the burn area will be monitored. As required by current policy, **this monitoring will occur during the first year after fire containment.** If the monitoring indicates the fire has exacerbated the existing weed problem funding avenues for treatment will be pursued.

#### TRAIL TREATMENTS:

The existing system trails within the Bob Marshall Fire Complex have numerous areas/structures affected by the fire including: stream crossings, waterbars, turnpike areas, and the trail prism in some areas. The purpose of this work is to decrease the risk that post-fire trail and hillslope surface water flows will cause significant soil erosion and stream sedimentation. Some of these potential post-fire erosion situations are a risk to public safety by the users of the wilderness area.

*Maintain Drainage Structures on Trails:* Install and maintain waterbars, drain dips, relief ditches, and culverts on trails that traverse moderate and high severity burn areas (that are safe to access this fall) to prevent erosion that may occur during spring runoff.

*Install/Maintain Erosion Control Structures:* Within one year of containment, install and maintain waterbars, culverts, drain dips, relief ditches, and the turnpike logs/tread, on trails that traverse moderate and high severity burn areas to prevent erosion and trail degradation. Some of the treatments will be maintenance of existing structures, and some will replacement of burned structure or additional needed post-fire structures. Where needed on steeper hillslopes (35 to 60+%) that burned with moderate or high

burn severity, to install curb logs as to reduce soil ravel on to the trail surface. This work is needed within one year, but after spring runoff, to protect these trails over the long term and provide for public safety.

Field surveys revealed extensive areas of trees susceptible to tip-over due to the roots and/or boles of the trees being burned out. These hazard trees are a very serious human safety issue for users of the wilderness trail system. The removal of hazard trees is needed on the sections of trail where post-fire rehab work is being done to provide a safe working environment for BAER crews. Most of the hazard tree concerns are in the moderate and high severity burn areas, and that is where other BAER treatments would be accomplished.

*Hazard Tree Treatment – Trails:* Within one year of containment, cut and remove standing, leaning, and fallen hazard trees along the system trails, primarily within moderate and high severity burn areas, that were weakened by the fires. Wait until summer of 2008 to allow seasonal winds and snow to bring down much of the imminent hazards and allow for a safer work environment, as well as a more natural appearance.

*Install Hazard Warning Signs:* Install 18 hazard warning signs at the wilderness access portals to communicate to the public of the post-fire hazard trees and flash flood potential. Also, to replace 12 burned directional signs at trails junctions to provide for public safety.

#### I. Monitoring Narrative:

##### BAER Implementation Monitoring

After the implementation of the various BAER treatments members of the district staff and watershed specialists (approximately five individuals) will review the implementation and effectiveness of these projects.

## **PART VI - EMERGENCY REHABILITATION TREATMENTS AND SOURCE OF FUNDS BY LAND OWNERSHIP**

**Please see attached spreadsheet.**

## **PART VII - APPROVALS**

1.	<u>/s/ Catherin Barbouletos</u> Forest Supervisor (signature)	<u>9/21/07</u> Date
2	_____ Regional Forester (signature)	Date _____