USDA-FOREST SERVICE FS-2500-8 (6/06)

Date of Report: 10/05/2012

2012

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[X] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[X] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization 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: Damnation

C. State: Montana D. County: Flathead

E. Region: Northern (1) F. Forest: Flathead

G. District: Spotted Bear H. Fire Incident Job Code: P1HVV8

I. Date Fire Started: August 11, 2013 J. Date Fire Contained: No active suppression

K. Suppression Cost: <$200,000

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 0
2. Fireline seeded (miles): 0
3. Other (identify): 0

M. Watershed Numbers: 170102090304

N. Total Acres Burned: 8,246 as of September 19, 2013
NFS Acres(8,246) Other Federal () State () Private ()

O. VegetationTypes: Douglas fir, ponderosa pine, larch, sub-alpine fir, riparian

P. Dominant Soils: The following landtypes are within the burned area: 73, 76, 77, 78, 72, 54, 55

Map Unit	Landtype Association (landform)	Parent Material	Order III Landypes
III	Forested Ground Moraine		26-7, 26-8, 23-7, 23-8, 24-7, 24-8
VII	Forested Cool Aspect Breaklands		73, 76, 77
VIII	Forested Warm Aspect Breaklands		78

Q. Geologic Types: The burned area lies on the following geologic formations from the South Fork Flathead River to the ridge tops: Quaternary Alluvium, Sheppard, Snowslip, Mount Shields, Bonner, McNamara, and Garnet. These formations include a variety of lithologies including quartzite, limestone, siltite, and argillite.

R. Miles of Stream Channels by Order or Class:

Stream miles by order within perimeter.

Stream Order	Length (Miles)
1	10
2	4
3	1
4	
5	
Grand Total	15

S. Transportation System

Trails: 10 miles Roads: 0 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): (unburned); 2,062 (low); 5,360 (moderate); 824 (high)

B. Water-Repellent Soil (acres): High severity portions have varying degrees of water repellency

C. Soil Erosion Hazard Rating (acres):
4,250 (low) 2,500 (moderate) 1,500 (high)

D. Erosion Potential: 0.8 tons/acre

E. Sediment Potential: 0.5 tons/acre

PART IV - HYDROLOGIC DESIGN FACTORS

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

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

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

D. Design Storm Duration, (hours): 6 hour

E. Design Storm Magnitude, (inches): 1.5 inches

F. Design Flow, (cubic feet / second/ square mile): 5 cfs/mi^2

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

H. Adjusted Design Flow, (cfs per square mile): 70 cfs/mi^2

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Summary of Potential Watershed Response

The burned area is located on the east side of the South Fork Flathead River within the Helen, Damnation, and Lewis Creek watersheds. These are relatively small drainages, with high relief. Several first order channels between the three main drainages flow directly to the river. On September 7th and 8th, two rain events on the burned area caused significant flooding. As a result of stormflow, three first order channels directly above the river scoured down to bedrock. Prior to the flood, these channels were minor crenulations or small swales with little evidence of scour or deposition.

The valley bottom along the South Fork Flathead River is relatively wide and consists of forested ground moraine. Hillslopes consist of forested breaklands. The majority of precipitation in the burned area occurs as snow during the winter months. Peak discharges typically occurs during snowmelt, snowmelt mixed with rain, or in rare cases, rain-on-snow. Runoff potential is relatively high in areas that experienced high burn severity.

As evidenced by the recent storm event, the steeper portions of the burned area can produce large volumes of water and sediment. This is particularly the case on west facing aspects which are generally very steep scarp slopes (breaklands) with thin soils. These hillslopes are considered high energy, or "flashy".

Values at Risk:

The risk matrix below was used to evaluate the Risk Level for each value identified during Assessment (Exhibit 2 of Interim Directive No.: 2520-2010-1). Proposed treatments and their associated risk levels are discussed below in the following categories: Life, Property, and Natural Resources.

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	**Very High**	**Very High**	**Low**
Likely	**Very High**	**High**	**Low**
Possible	**High**	**Intermediate**	**Low**
Unlikely	**Intermediate**	**Low**	**Very Low**

Human Life and Safety: Forest Users on Backcountry Trails

User safety on trails 80, 470, and 263 is a concern due to trail damage[1] and hazard trees

Risk Assessment – Threats to trail users from impaired trail conditions

Probablity of Damage or Loss: Possible

Magnitude of Consequence: Moderate – personal injury or fatality

Risk Level: Intermediate – Stabilize trails using standard techniques to provide user safety; remove hazard trees to protect field crews during work.

Property: Forest Service Trails

Risk Assessment – Threats to Forest Service trails and associated structures

Probablity of Damage or Loss: Very Likely – High potential for erosion of surface tread and sediment delivery to streams. Soil deposition on trail surfaces from adjacent hillslopes may also occur. The probability is considered very likely because some damage has already occurred due to a recent storm event.

Magnitude of Consequence: Major – Portions of Trail 80 are located on a very steep hillslope that has burned. It has been heavily damaged by recent flooding and more damage is very likely. Further damage will continue to impact the integrity of this trail. Addtionally portions of Trail 470 is also on a very steep hillslope and has a high likely hood of trail tread damage occruing with future erosion and sedimentation. The consequence of further damage would be increased cost of repair.

Risk Level: Very High – Complete trail inspection in all burned areas to ensure proper drainage structures are in place. Where needed, install water bars and other drainage structures to minimize the potential for surface erosion and sediment delivery. Considering the existing conditions found on the trails surveyed, trail damage and some off-trail erosion/sediment delivery to channels is likely to occur along identified sections of the trails with vulnerable conditions. Trail incision and complete loss of trail tread could occur, therefore resulting in loss of infrastructure possibly leading to significant repairs and costs to restore sections of trail. Loss of water control may lead to off-trail slope erosion and gully formation. Once active gullies develop, they can continue to erode during each storm event and contribute to downstream sedimentation and trail instability. Approximately 8 miles of Trail 80 runs along the valley bottom on the east side of the South Fork Flathead. This is the "main-line" trail that provides the primary access into the Bob Marshall Wilderness. Much of the trail has high future risk of direct sedimentation in the South Fork of the Flathead River. Trail 470 is 3 miles in length accessing the historic Mud Lake Look Out. There are

[1] Trail damage may include loss of structures including water bars, retaining walls, cribs, pungeons, or turnpikes.

several draws in this route that have the potential to cause further damage to the trail. This also feeds into the South Fork of the Flathead River.There is 1/8 mile of trail burned on the West Side Trail # 263 that had existing turnpike burned that provided drainage for seeps and a wetland area.

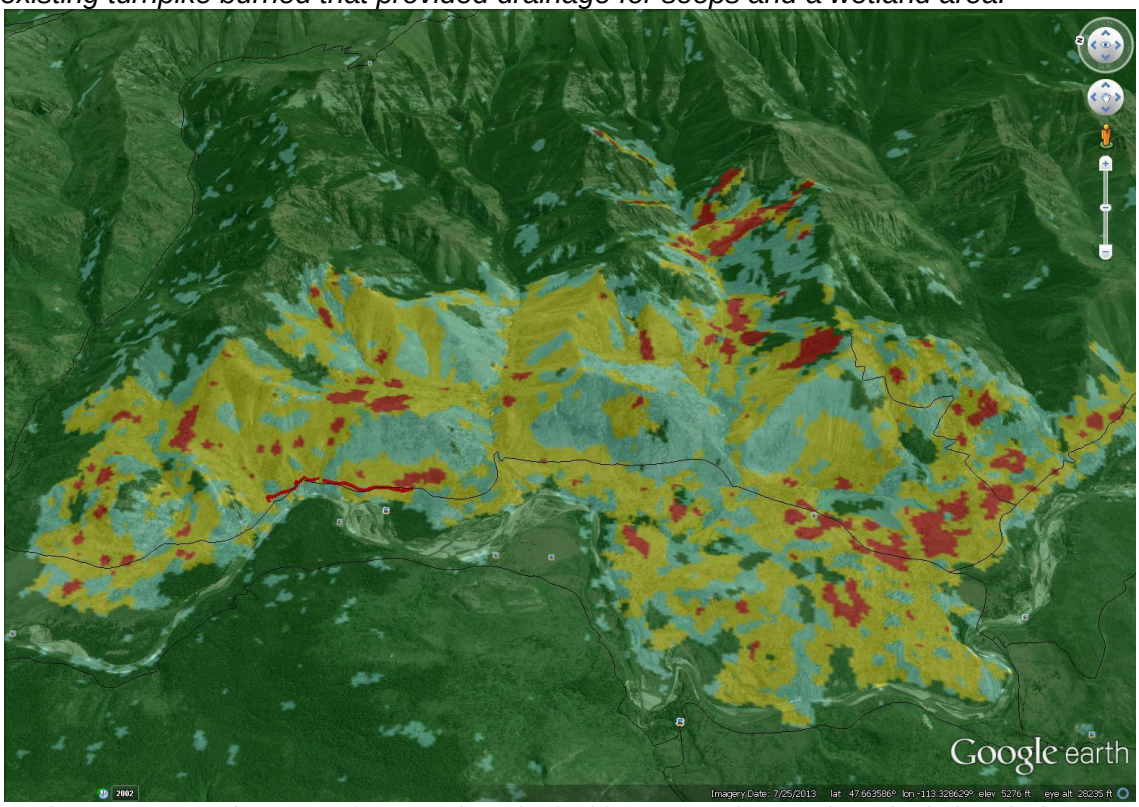

Figure 1. BARC imagery of Damnation Fire looking east. The South Fork Flathead River froms the western boundary of the burned area. Trails are shown in black. High risk trail sections are shown in bold black and red.

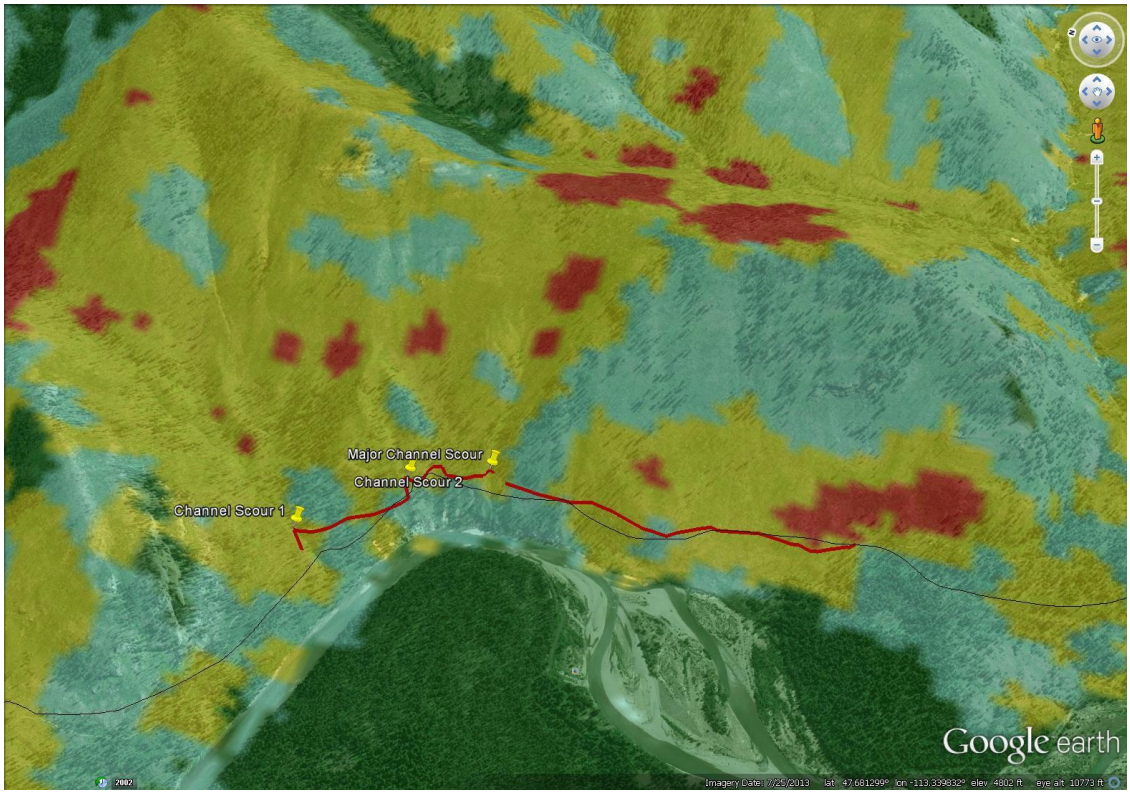

Figure 2. High risk sections of the main-line trail looking south. This section is located on a steep, linear hillslope above the SF Flathead River. Recent channel scour locations are highlighted.

Natural Resources: Native Plant communities

Noxious weeds are present in the burned area in the corridor of the South Fork of the Flathead River. These populations while currently small in size have the potential with the available seed bed created by the fire to spread into burned areas.These areas are between the Phil Creek entering into the South Fork River and to the north end of Independence Park (approximately 7 river corridor miles about ¼ mile wide) that is predominately spotted knapweed. There are additional isolated popoulations orange hawkweed, sulfur cinquifoil, along Trail #80 over the 8 miles.

Risk Assessment – Threats to native plant communities.

Probablity of Damage or Loss: Likely - Based on burn severity and proximity to potential weed populations.

Magnitude of Consequence: Moderate – Loss of native plant communities and spread of noxious weeds.

Risk Level: Intermediate – Invasive species treatment is needed on known poputlation locations and additional Invasive species monitoring next year will determine if weeds spread of weeds is occuring. nt. Primary risk comes from the existing populatons that are be present along Trail 80, and in the river corridor. Invasive species mitigation is only allowed during year one.

B. Emergency Treatment Objectives:

As noted above, threats to life, property, and natural resources could potentially result from post-fire conditions in the burned area. For these reasons the primary treatment objectives are:

- Minimize potential effects of post-fire conditions on human life and safety, particularly on Trails 80 and 470 within moderate and high burn severity. Erosion and continued loss of trail infrastucture are the primary risks.

- Minimize potential effects of post-fire conditions on natural resources, primarily soil productivity, water quality, and native plant communities. Primary hazards includes erosion, sediment delivery, and spread of noxious weeds.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:

Land **0** % Channel **N/A** % Roads/Trails **10** % Protection/Safety **10** %

Work on trails can start immediately following approval of BAER request. This work would continue until snowfall, then resume in the spring.

D. Probability of Treatment Success

	Years after Treatment		
	1	2	3
Land	0	100	N/A
Channel	N/A	N/A	N/A

Roads/Trails	10	90	N/A
Protection/Safety	10	90	N/A

E. Cost of No-Action (Including Loss): $ 165,900

F. Cost of Selected Alternative (Including Loss): There remains a 20% chance that the proposed treatments for this initial work may not succeed. Total cost of the action alternative plus this 20% chance of failure is $ 117,540

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Craig Kendall

Email: ckendall@fs.fed.us Phone: 406-758-6485

H. Treatment Narrative:

The proposed treatments on National Forest System lands can help to reduce the impacts of the fire, but treatments will not completely mitigate the effects of the fire. The treatments listed below are those that are considered to be the most effective on National Forest System lands given the local setting including topography and access. The attached Excel worksheet summarizes the funding request.

Road and Trail Treatments:

- Install and/or maintain existing drainage control structures on 11 miles of trail that will reduce potential for further trail impacts and provide for safety along the trail.
- Remove hazard trees as necessary to provide safe environment for FS employees and trail users.
- Install signs to warn trail users of post-fire hazards.

Land Treatments:

- Monitor burned area in 2014 to determine level of weed spread.
- Spray newly established weeds.
- Spray existing populations of weeds in burned area.

I. Monitoring Narrative:

PART VII - APPROVALS

1. /s/Chip Weber _____ _____
   Forest Supervisor Date

2. /s/_
   Regional Forester Date