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

Date of Report: 10/07/2015

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: Trail Creek

C. State: Montana D. County: Flathead

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

G. District: Spotted Bear H. Fire Incident Job Code: P1J1G3

I. Date Fire Started: August 10, 2015 J. Date Fire Contained: Not contained

K. Suppression Cost: $149,495

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

M. Watershed Numbers: 170102090304

N. Total Acres Burned:
NFS Acres(19,644) Other Federal () State () Private ()

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

P. Dominant Soils:

LANDTYPE	ACRES	Landform	Parent Material	Erodibility
VI	3503.49	Cirque Headwalls and Alpine Ridges	Metasedimentary Rocks	L
72	3002.83	Cirque Headwalls and Alpine Ridges	Metasedimentary Rocks	L
73	2666.23	Glacial Trough Walls	Glacial Till and Metasedimentary Rocks	M
57-8	1780.85	Glaciated Mountain Ridges	Metasedimentary Rocks	L
VII	1762.41	Glacial Trough Walls and Structural Breaklands	Glacial Till and Metasedimentary Rocks	M
26J-7	1443.85	Moraines	Glacial Till	M
32	1178.16	Landslide Deposits	Landslide Deposits and Metasedimentary Rocks	M
26J-8	1049.89	Glaciated Mountain Slopes	Glacial Till	M
54	762.79	Cirque Basins	Metasedimentary Rocks	Not Rated
Va	672.75	Glaciated Mountain Ridges and Cirque Headwalls	Glacial Till and Metasedimentary Rocks	L
II	668.41	Cirque Basins	Glacial Till and Metasedimentary Rocks	M
23-8	542.66	Glaciated Mountain Slopes and Ridges	Glacial Till and Metasedimentary Rocks	L
21-9	408.34	Cirque Basins	Glacial Till and Metasedimentary Rocks	M
26A-7	404.67	Moraines	Glacial Till	L
28	391.38	Terraces	Glacial Outwash	L
10-2	351.11	Stream Bottoms	Alluviual Deposits	L
75	349.73	Structural Breaklands	Limestone	Not Rated
26C-9	345.49	Glaciated Mountain Slopes	Glacial Till	L
III	312.97	Glaciated Mountain Slopes and Ridges	Glacial Till and Metasedimentary Rocks	L
Vc	240.92	Glaciated Mountain Ridges	Metasedimentary Rocks	L
55	147.54	Glaciated Mountain Slopes	Metasedimentary Rocks	Not Rated
IV	97.65	Landslide Deposits	Landslide Deposits and Metasedimentary Rocks	L
16	52.53	Alluvial Fans	Alluviual Deposits	L
Vb	30.20	Glaciated Mountain Ridges	Metasedimentary Rocks	L
26C-7	17.69	Moraines	Glacial Till	L
74	14.79	Stream Breaklands	Glacial Drift and Metasedimentary Rocks	Not Rated (Assume Moderate to High)
12	0.41	Terraces, Floodplains and Morianes	Organic Deposits	L
Total	22199.76			

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	23
2	9
3	1
4	0
5	0
Grand Total	33

S. Transportation System

Trails: 28 miles Roads: 19 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 2,548 (unburned); 6,631 (low); 6,076 (moderate); 6,936 (high)

B. Water-Repellent Soil (acres): High severity and moderate portions have varying degrees of water repellency, as determined by drip test and infiltrometer.

C. Soil Erosion Hazard Rating (acres):
11,748 (low) 9,177 (moderate) 15 (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 Trail Creek Fire burned over 19,000 acres northeast of the Spotted Bear Ranger Station. The fire burned on the north side of the Spotted Bear River in several small catchments with first and second order streams. Relatively large portions of the Whitcomb, Bent, Trail, and South Creek catchments burned with varying degrees of severity (Figure 1). Severity is mixed, but dominated by low and moderate. These catchments have south and southwest aspects, and are considered to be high energy. Stream channels move large amounts of bed material due to high relief of catchments and aspect.

Landforms in the burned area consist of cirque basins, alpine ridges, glacial trough walls, breaklands, alluvial fans, and floodplains. Channel morphology ranges between extremely steep headwater channels to moderately steep alluvial channels.

The initial BARC imagery over-estimated burn severity, which is common. Adjustments to the imagery were made, based on field observations of all three categories. The Forest Soil Scientist and Forest Hydrologist determined that areas classified as high severity are definitely on the low end of this category. Organic matter is still present over much of the areas classified as high severity. Soils were determined to be strongly water repellent, based on drip tests and infiltrometer data.

Even though water repellency was observed in the field, the presence of organic matter (well intact in many places) has high infiltration capacities and storage potential. On August 31st, 0.62 inches of rain fell onto portions of the burned area, and few signs of surface runoff or erosion were observed in the field. Subsequent rains since August 31st have not caused observable erosion.

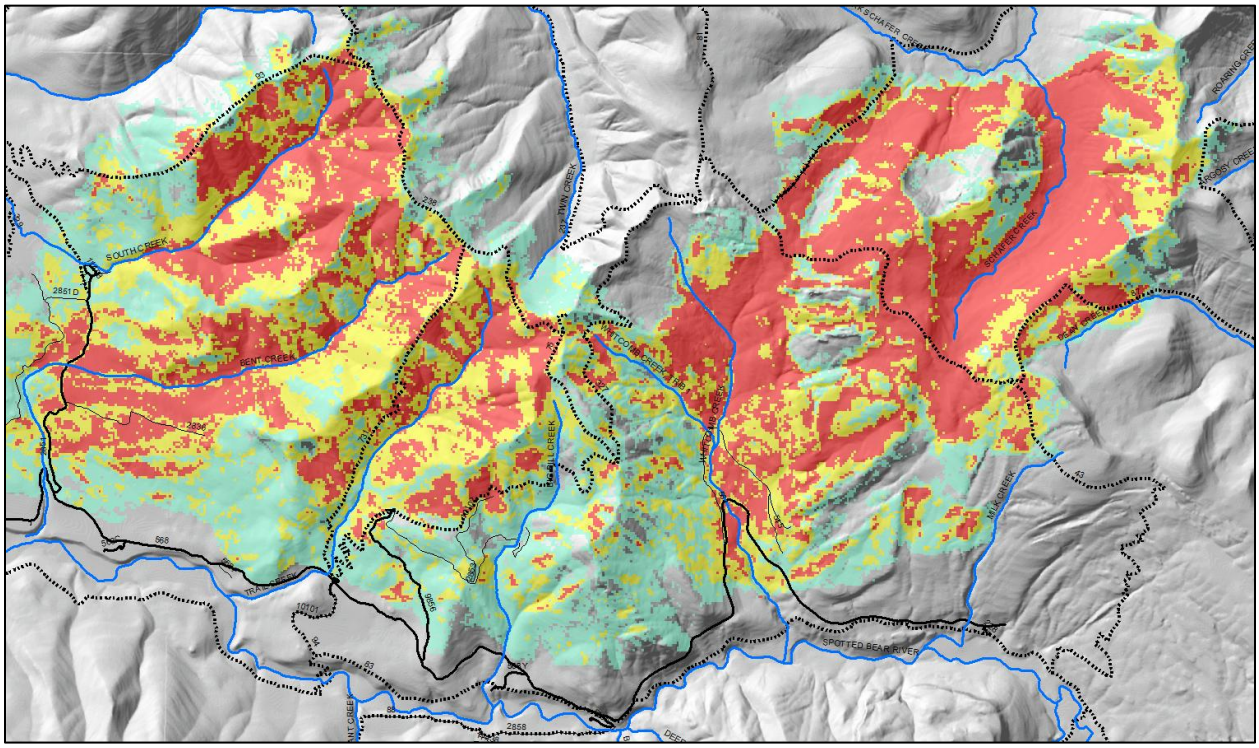

Figure 1. Trail Creek BARC map.

Values at Risk:

The risk matrix below and associated definitions were used to evaluate risk levels in the 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**

Probability of Damage or Loss: The following descriptions provide a framework to estimate the relative probability that damage or loss would occur within 1 to 3 years (depending on the resource):

- Very likely. Nearly certain occurrence (90% - 100%))
- Likely. Likely occurrence (50% - 89%)
- Possible. Possible occurrence (10% - 49%)
- Unlikely. Unlikely occurrence (0% - 9%)

Magnitude of Consequences:

- Major. Loss of life or injury to humans; substantial property damage; irreversible damage to critical natural or cultural resources.
- Moderate. Injury or illness to humans; moderate property damage; damage to critical natural or cultural resources resulting in considerable or long term effects.
- Minor. Property damage is limited in economic value and/or to few investments; damage to critical natural or cultural resources resulting in minimal, recoverable or localized effects.

Property: Forest Service Trails

Risk Assessment: Trail Infrastructure

Probablity of Damage or Loss: Likely (50-89% chance)

Magnitude of Consequence: Moderate

Risk Level: High

Numerous trails in the burned area are at risk of further damage that is likely to occur in the next 12 months. This future damage is likely to occur through the following mechanisms.

- Direct erosion of tread due to loss of drainage features such as water bars and dips
- Direct erosion of tread due to loss of adjacent and upslope vegetation
- Fillslope failure due to direct loss of forested vegetation and root systems. This potential failure mechanism is likely to occur on steep hillslopes with moderate and high burn severity.
- Fillslope failure due to direct loss of crib logs and/or retaining wall structures.

Trail segments that would be eligible for emergency treatments were identified using the BAER Emergency Response Strategy Checkpoint List. To help answer some of the key questions in the

checkpoint list, the following landscape and trail filters were used to separate short term (<12 months) risks from long term risks.

- Burn severity levels adjacent to and upslope of trail segments
- Hillslope position (ridgetop, midslope, or valley bottom) of trail segments
- Hillslope gradient
- Aspect
- Iminent risk of furhther loss of trail prisms in the next 12 months

B. Emergency Treatment Objectives:

- Prevent additional loss of trail infrastructure that is likely to occur in the next 12 months

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

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

Work on trails can start immediately following approval of BAER request. This work would continue until snowfall, then resume in the spring. Further damage to trails is expected to occur in the spring before BAER work is initiated.

D. Probability of Treatment Success

	Years after Treatment		
	1	2	3
Land	N/A	N/A	N/A
Channel	N/A	N/A	N/A
Roads/Trails	10	50	100
Protection/Safety	N/A	N/A	N/A

E. Cost of No-Action (Including Loss): $153,000

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 $140,309

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Craig Kendall

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

H. Treatment Narrative:

The proposed trail treatments are designed to prevent further loss of prisms. This loss is likely to occur in the next 12 months without treatment. In addition, the cost of these treatments is expected to be less than complete reconstruction of prisms in the event of complete loss. To provide for trail worker safety, hazard trees would be removed along all sections of trail approved for treatment. Proposed treatments are summarized below.

- Replace damaged trail structures that were destroyed in the fire along sections of trail that are likely to experience further loss in the next 12 months.
- Construct new trail structures along sections of trail that are likely to experience further loss in the next 12 months.
- 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.

I. Monitoring Narrative:

Monitoring of post-fire conditions and the effects of storm events will be monitored informally by ranger district personnel and reported to the Forest BAER Coordinator. Continued monitoring and inventory of trail conditions is likely to result in submission of an Interim 2500-8 in the coming months.

PART VII - APPROVALS

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

2. /s/ _____ _____
   Regional Forester Date

Line Items	Units	Unit Cost	NFS Lands # of Units	BAER $	Other $
A. Land Treatments					
Subtotal Land Treatments				$0	$0
B. Channel Treatments					
Insert new items above this line!				$0	$0
Subtotal Channel Treat.				$0	$0
C. Road and Trails					
Big Bill Schafer Creek #327	miles	~~$6,833~~ $4,340	7.1	~~$48,516~~ $30,816	
Trail Creek #731	miles	~~$4,808~~ $1,256	3.8	~~$18,272~~ $4,772	
Gunsight Peak #47	miles	$8,521	3.5	$29,824	
Dean Creek #87	miles	~~$2,438~~ $1,648	1.9	~~$4,632~~ $3,132	
Spy Mountain #238	miles	$144	3.7	$532	
Insert new items above this line!					
Subtotal Road & Trails				~~$101,776~~ $69,076	$0
D. Protection/Safety					
Post-fire Hazard Signs	each	300	6	$1,800	
					$0
Insert new items above this line!				$0	$0
Subtotal Structures				$1,800	$0
E. BAER Evaluation					
Team Evaluation	each				$9,000

Insert new items above this line!				---	$0
Subtotal Evaluation				$0	$9,000
F. Monitoring					
Post-fire Monitoring	each			$0	$0
Insert new items above this line!				$0	$0
Subtotal Monitoring				$0	$9,000
G. Totals				**$~~103,576~~ $70,876**	$9,000