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: Bear 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: $ 2,572,973

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 1
2. Fireline seeded (miles): 17
3. Other (identify): 0

M. Watershed Numbers: 170102090304

N. Total Acres Burned:
NFS Acres(50,820) Other Federal (0) State (0) Private (0)

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

P. Dominant Soils:

LANDTYPE	Acres	Landform	Parent Material	Erodibility
VII	15229.51	Glacial Trough Walls and Structural Breaklands	Glacial Till and Metasedimentary Rocks	Moderate
VI	10228.85	Cirque Headwalls and Alpine Ridges	Metasedimentary Rocks	Low
73	6043.81	Glacial Trough Walls	Glacial Till and Metasedimentary Rocks	Moderate
77	3561.16	Structual Breaklands	Metasedimentary Rocks	Low
VIII	3118.32	Glacial Trough Walls and Structural Breaklands	Metasedimentary Rocks	Low
Vb	2463.23	Glaciated Mountain Ridges	Metasedimentary Rocks	Low
57-8	2064.09	Glaciated Mountain Ridges	Metasedimentary Rocks	Low
76	2006.57	Structual Breaklands	Metasedimentary Rocks	Low
32	1702.81	Landslide Deposits	Landslide Deposits and Metasedimentary Rocks	Moderate
26C-7	1669.82	Moraines	Glacial Till	Low
72	1630.98	Cirque Headwalls and Alpine Ridges	Metasedimentary Rocks	Low
75	1620.71	Structual Breaklands	Limestone	Not Rated
27-7	1352.79	Kames and Kettles or Terraces	Glacial Till	Low
57-9	1285.08	Glaciated Mountain Ridges	Glacial Till and Metasedimentary Rocks	Low
III	1278.90	Glaciated Mountain Slopes and Ridges	Glacial Till and Metasedimentary Rocks	Low
26C-8	1081.36	Glaciated Mountain Slopes	Glacial Till	Low
II	969.01	Cirque Basins	Glacial Till and Metasedimentary Rocks	Moderate
21-8	882.86	Cirque Basins	Glacial Till and Metasedimentary Rocks	Moderate
26D-7	818.11	Moraines	Glacial Till	Moderate
26D-8	779.54	Glaciated Mountain Slopes	Glacial Till	Moderate
31	667.83	Landslide Deposits	Landslide Deposits and Metasedimentary Rocks	Low
16	456.39	Alluvial Fans	Alluviual Deposits	Low
74	417.46	Stream Breaklands	Glacial Drift and Metasedimentary Rocks	Not Rated (Assume Moderate to High)
Va	284.95	Glaciated Mountain Ridges and Cirque Headwalls	Glacial Till and Metasedimentary Rocks	Low
I	239.09	Stream Bottoms	Alluviual Deposits	Low
Vc	148.68	Glaciated Mountain Ridges	Metasedimentary Rocks	Low
IV	145.45	Landslide Deposits	Landslide Deposits and Metasedimentary Rocks	Low
26A-8	126.07	Glaciated Mountain Slopes	Glacial Till	Low
21-9	86.72	Cirque Basins	Glacial Till and Metasedimentary Rocks	Moderate
Ib	47.54	Kames and Kettles or Terraces	Glacial Till	Low
23-8	29.77	Glaciated Mountain Slopes and Ridges	Glacial Till and Metasedimentary Rocks	Low
Total	62437.46			

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	110
2	34
3	10
4	2
5	
Grand Total	156

S. Transportation System

Trails: 68 miles Roads: 39 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 11,609 (unburned); 23,134 (low); 18,028 (moderate); 9,657 (high)

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

C. Soil Erosion Hazard Rating (acres):
33,887 (low) 26,512 (moderate) 417 (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 Bear Creek Fire burned approximately 50,000 acres on the east and west side of the South Fork Flathead River near the Spotted Bear Ranger Station. Relatively large portions of the Bunker Creek, Mid Creek, and Black Bear watersheds were burned. Severity is mixed, but dominated by low and moderate

(Figure 1). One exception is the valley bottom in Bunker Creek. During a three hour period the majority of the valley bottom burned and is classified as high severity. Most of this area is on flat ground.

Landforms in the burned area consist of cirque basins, alpine ridges, glacial trough walls, breaklands, moraines, alluvial fans, and floodplains. Channel morphology ranges between extremely steep headwater channels to low gradient, self-formed 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 any observable erosion.

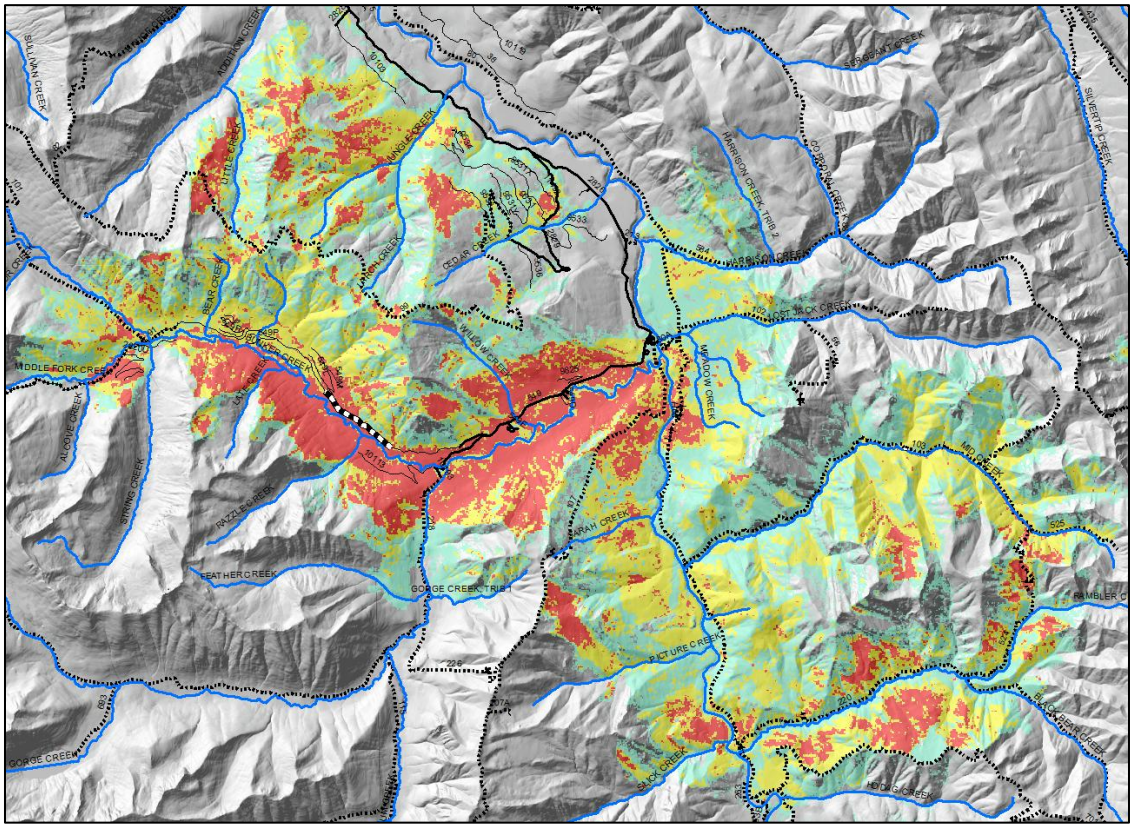

Figure 1. Bear Creek BARC map.

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

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): $ 328,000

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 $ 301,000

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology	[X] Soils	[ ] Geology	[ ] Range
[] Forestry	[ ] Wildlife	[X] Fire Mgmt.	[X] Engineering
[X] Recreation	[ ] Ecology	[X] Botany	[ ] Archaeology
[X] 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!					
Subtotal Channel Treat.				$0	$0
C. Road and Trails				$0	
East Side South Fork River #80	miles	~~6538~~ $4,823	14.0	~~$91,528~~ $67,528	
Mid Creek #103	miles	~~5288~~	8.9	~~$47,060~~ $0	
Black Bear Creek #220	miles	~~1476~~ $784	5.2	~~$7,676~~ $4,076	
Rambler Creek #524	miles	~~7872~~	5.5	~~$43,296~~ $0	
Scenic Bypass #80H	miles	2832	0.5	$1,416	
Sara Peak Picture Ridge #107	miles	277	6.0	$1,660	
Gorge Creek #218	miles	200	2.2	$440	
Hodag Ridge #701	miles	96	5.0	$480	
Chipmunk Peak #99	miles	~~1836~~ $979	14.0	~~$25,700~~ $13,700	
Insert new items above this line!					
Subtotal Road & Trails				~~$219,256~~ $89,300	$0
D. Protection/Safety					
Post-fire Hazard Signs	each	400	12	$4,800	
Insert new items above this line!					
Subtotal Structures				$4,800	$0
E. BAER Evaluation					
Team Evaluation					$12,000
Insert new items above this line!					
Subtotal Evaluation	each			$0	$12,000
F. Monitoring					
Post-fire Monitoring				$0	$0
Insert new items above this line!					
Subtotal Monitoring				$0	$0

G. Totals				~~$224,056~~ $94,100	$12,000