

Date of Report: 10/07/2019

**BURNED-AREA REPORT**  
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST****A. Type of Report**

- ☒ 1. Funding request for estimated emergency stabilization funds  
☐ 2. Accomplishment Report  
☐ 3. No Treatment Recommendation

**B. Type of Action**

- ☒ 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:** Snow Creek**C. State:** Montana**D. County:** Flathead**E. Region:** Northern (1)**F. Forest:** Flathead**G. District:** Spotted Bear**H. Fire Incident Job Code:** P1MK1Y19 (0110)**I. Date Fire Started:** August 3, 2019**J. Date Fire Contained:** Wilderness Fire. Mostly out now.**K. Suppression Cost:** N/A (managed fire)**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:** 170102090207**N. Total Acres Burned:** 1,815

NFS Acres (1,815)   Other Federal ()   State ()   Private ()

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

P. Dominant Soils:

Wilderness Map Symbol	Landform	Parent Material	Erodibility
VI	Cirque Headwalls and Alpine Ridges	Metasedimentary Rocks	L
VII	Glacial Trough Walls and Structural Breaklands	Glacial Till and Metasedimentary Rocks	M
Va	Glaciated Mountain Ridges and Cirque Headwalls	Glacial Till and Metasedimentary Rocks	L
II	Cirque Basins	Glacial Till and Metasedimentary Rocks	M
III	Glaciated Mountain Slopes and Ridges	Glacial Till and Metasedimentary Rocks	L
IIIa	Forested Steep Lateral Moraine	Glacial Till and Metasedimentary Rocks	L
Vc	Glaciated Mountain Ridges	Metasedimentary Rocks	L
IV	Landslide Deposits	Landslide Deposits and Metasedimentary Rocks	L
Vb	Glaciated Mountain Ridges	Metasedimentary Rocks	L

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, Snowlip, 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	0.0
2	0.0
3	2.6
4	2.5
5	0.0
Grand Total	9.5

S. Transportation System

Trails: 4.0 miles      Roads: 0 miles

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

A. Burn Severity (acres): (unburned); 600 (low); 944 (moderate); 272 (high)

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

C. Soil Erosion Hazard Rating (acres):  
630 (low) 635 (moderate) 550 (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<sup>2</sup>

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

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

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

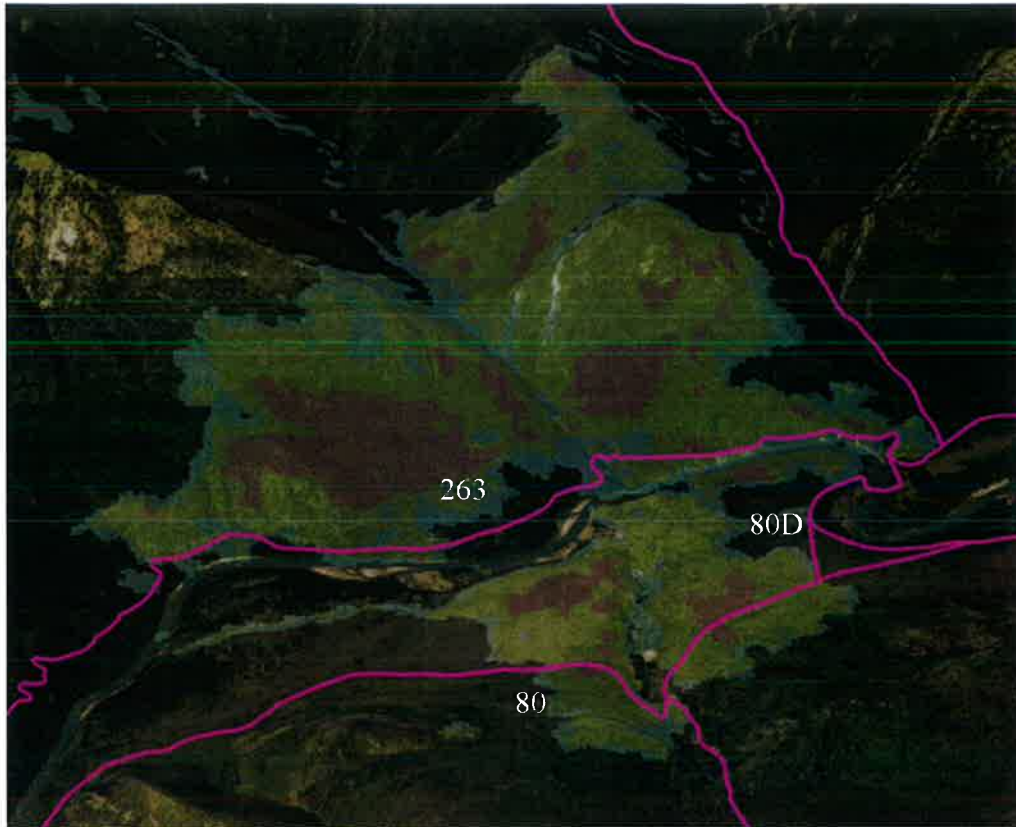
##### **A. Describe Critical Values/Resources and Threats:**

###### Summary of Potential Watershed Response

*The Snow Creek Fire burned roughly 1,815 acres, along the South Fork Flathead River in the Bob Marshall Wilderness. Small portions of the Snow Creek and Helen Creek drainages were also burned. The fire burned in a mosaic pattern and resulted in a well distributed mix of severity levels (Figure 1). Overall, the pattern of burn severity is typical of past fires in the Bob Marshall Wilderness.*

*Landforms in the burned area consist of active floodplain, terraces, alluvium, colluvium, and deep glacial-fluvial deposits.*

*The BARC imagery has not been field verified, but past experience has shown that initial imagery slightly over-estimates severity on the Flathead National Forest. Several fires have burned on the forest during the past couple of decades. Watershed response tends to be relatively mild because fall rains tend to be of long duration and short intensity. In low and moderate severity burns, needle cast is common, which aids in infiltration. Erosion is likely to occur during spring snowmelt and rain. Recovery of burned areas is typically quite rapid (3-5 years).*



*Figure 1. Snow Creek Fire looking west. Trails are shown in pink.*



*Figure 2. Close-up of 0.25 mile stretch of Trail 263 along very steep glacial till on river above the river.*

## 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*

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

*Magnitude of Consequence: Moderate*

*Risk Level: High*

Trails 263, 80, and 80D run through the burned area (Figure 1). Trail 263 is called the Westside Trail and 80 is called the East Side Trail. Both provide the primary access to the Bob Marshall Wilderness from Spotted Bear. They are used heavily by outfitters and the public during the summer and fall months. These trails 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 trail prisms due to loss of drainage structures and deposition from upslope.
- 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 following landscape and trail filters 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
- Imminent risk of further loss of trail prisms in the next 12 months

Trail grades within the area vary from 5% to 20% with hillslope gradients up to 40%. One section of the 263 Trail is close to a 90% slope. Pre-fire trail conditions within the fire perimeter ranged from excellent to good with annual maintenance occurring on all of the trails, and recent improvements to address deferred maintenance on some.

### **Natural Resources: Native Plant communities**

*Noxious weeds are within and adjacent to the burned area. These populations are substantial in size and have the potential with the available seed bed to spread into burned areas.*

*Risk Assessment – Threats to native plant communities*

*Probability of Damage or Loss: Likely - Based on burn severity and proximity to existing weed infestations.*

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

*Risk Level: High – Invasive species treatment is needed for areas adjacent to documented infestations. Additional invasive species monitoring next year will determine if weeds spread is occurring further into the burned area.*

There are roughly 64 acres of potential post-fire weed establishment in the burn area. These acres occur on abandoned channels, floodplains, terraces, and along trails. Species include spotted knapweed, Canada thistle, houndstongue, oxeye daisy, cheatgrass, tall tumbled mustard, bull thistle, sulfur cinquefoil, and yellow toadflax.

## **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:

- Prevent additional loss of trail infrastructure that is likely to occur in the next 12 months
- Minimize potential effects of post-fire conditions on the spread of noxious weeds.

## **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	75	75
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):** \$68,408

**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 \$ 62,935

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

Team Leader: Craig Kendall

Email: [craigkendall@fs.fed.us](mailto:craigkendall@fs.fed.us) Phone: 406-758-6485

## H. Treatment Narrative:

The proposed trail treatments are designed to prevent further loss of trail 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.

- EDRR for weeds to prevent or minimize spread into burned areas of native plant communities.
- Repair damaged trail drainage 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 drainage 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 work 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. Wildfire is almost a perennial event in the Bob Marshall Wilderness Complex. Trail stabilization success will often depend on the parent material. The location of the trail in friable glacial till creates a higher burden for effective stabilization due to the incohesive parent material. Monitoring the effectiveness of the coir logs in addition to drainage features added could aid with future treatment efficacy. The estimated 5 days of monitoring would document best practices.

## PART VI - EMERGENCY STABILIZATION TREATMENTS AND SOURCE FUNDS

			NFS Lands		
		Unit	# of		Other
Line Items	Units	Cost	Units	BAER \$	\$
<b>A. Land Treatments</b>					
EDRR	acres	250	63.7	\$15,925	
<i>Subtotal Land Treatments</i>				\$15,925	\$0
<b>B. Channel Treatments</b>					
<i>Insert new items above this line!</i>				\$0	\$0
<i>Subtotal Channel Treat.</i>				\$0	\$0
<b>C. Road and Trails</b>					
Trail Stabilization (general)	miles	\$1,810	3.9	\$7,059	
<i>Insert new items above this line!</i>					
<i>Subtotal Road &amp; Trails</i>				\$7,059	\$0
<b>D. Protection/Safety</b>					
Post-fire Hazard Signs	each	300	5	\$1,500	
<i>Insert new items above this line!</i>				\$0	\$0
<i>Subtotal Structures</i>				\$1,500	\$0
<b>E. BAER Evaluation</b>					
Team Evaluation	each				\$1,500
<i>Insert new items above this line!</i>					\$0
<i>Subtotal Evaluation</i>				\$0	\$1,500
<b>F. Monitoring</b>					
Post-fire Monitoring	day	400	5	\$2,000	\$0
<i>Insert new items above this line!</i>				\$0	\$0
<i>Subtotal Monitoring</i>				\$2,000	\$1,500
<b>G. Totals</b>				<b>\$26,484</b>	<b>\$1,500</b>

## PART VII - APPROVALS

1.

18/   
Forest Supervisor

10/9/19  
Date



Appendix I. Trail rehabilitation and restoration request.

Project Description Form	
(Include a project description form for each project submitted in the request)	
<b>Treatment/Activity Name:</b>	Puncheon and Curb Log Replacement
<b>General Description:</b>	Rebuild puncheons and replace curb logs.
<b>Describe how the project meets funding criteria from guidance:</b>	<p>The Snow Creek Fire is within the 1 million acre Bob Marshall Wilderness. Sections of the two main-line trails that provide primary access to the Wilderness were burned over. Fires burn in this Wilderness every year and destroy infrastructure not eligible for replacement through BAER. The general public plus numerous outfitter and guides depend on these trails throughout the summer and fall. Because this Wilderness is so large, structure replacement is very expensive and CMTL funds are not adequate.</p> <ol style="list-style-type: none"> <li>1. This trail infrastructure was in place and operational prior to the fire.</li> <li>2. Maintenance was current on all trail sections affected by the fire (see Appendix 2).</li> <li>3. Work fits within FSH 7709.56b 105.1 Exhibit 1.</li> </ol>
<b>Design/Construction Specifications:</b>	Per FSH 7709.56 for trail construction
<b>Purpose of Treatment Specifications:</b> (relate to damage/change caused by fire)	To restore safe access to the Bob Marshall Wilderness and protect infrastructure from further loss.

Project Estimates (add lines if needed):			
<b>Agency Personnel Services:</b>			
Grade	Cost/hour	Hours needed	Total
WG-8 (3 trips for packer)	\$19.03	64	\$1,218
GS-5 Trails	\$16.27	56	\$911
GS-4 Trails	\$14.54	56	\$814
GS-3 Trails	\$12.95	56	\$725
GS-3 Trails	\$12.95	56	\$725
<b>Other Materials and Services (including contracting costs):</b>			
Item	Cost/unit	Units needed	Total
Materials (puncheon boards)	\$8.00	108	\$864
Field Per Diem (5 people)	\$198.00	7	\$1,386
Hardware	\$1.00	300	\$300
Trail 263 Curb Log Repair	\$12.00	1,300	\$15,600
<b>Total funding requested:</b>			<b>\$22,544</b>

OBJ_NAM	RTE_NUM	NAME	SECURITY_ID	EVENT	EVENT_SUBTYPE	ROE_BM	ROE_EM	EVENT_DATE	DATE_ACCURACY	CREATED_BY
TRAIL	263	WEST SIDE SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	20.5	2011-09-30 00:00	K - KNOWN	APKLUG
TRAIL	263	WEST SIDE SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	23.3	2012-09-30 00:00	K - KNOWN	APKLUG
TRAIL	263	WEST SIDE SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	23.3	2013-09-30 00:00	K - KNOWN	APKLUG
TRAIL	263	WEST SIDE SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	23.3	2014-09-30 00:00	K - KNOWN	APKLUG
TRAIL	263	WEST SIDE SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	23.3	2016-09-30 00:00	K - KNOWN	APKLUG
TRAIL	263	WEST SIDE SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	23.3	2017-09-30 00:00	K - KNOWN	APKLUG
TRAIL	263	WEST SIDE SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	23.3	2018-09-30 00:00	K - KNOWN	RLOWENS
TRAIL	80	MAIN SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	38.9	2011-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80	MAIN SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	38.9	2012-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80	MAIN SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	38.9	2013-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80	MAIN SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	38.9	2014-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80	MAIN SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	38.9	2015-09-30 00:00	K - KNOWN	DLMERCER11
TRAIL	80	MAIN SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	38.9	2016-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80	MAIN SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	38.9	2017-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80	MAIN SOUTH FORK	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	38.9	2018-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80D	BLACK BEAR BRIDGE FORD	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	1.45	2011-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80D	BLACK BEAR BRIDGE FORD	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	1.45	2012-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80D	BLACK BEAR BRIDGE FORD	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	1.45	2017-09-30 00:00	K - KNOWN	APKLUG
TRAIL	80D	BLACK BEAR BRIDGE FORD	0110	TRAIL ANNUAL ACCOMPLISHMENT	MILES MAINTAINED	0	1.45	2018-09-30 00:00	K - KNOWN	RLOWENS