



Forest Service

Beaverhead Deerlodge National Forest

420 Barrett Street
Dillon, MT 59725
208-935-2513-683-3900
FAX: 208-935-4275406-683-3855

File Code: 2520

Date: October 7, 2019

Route To:

Subject: McClusky Fire BAER Request

To: Leanne Marten, Northern Region Regional Forester

Enclosed is a Burned Area Emergency Response Authorization request for the McClusky Fire on the Beaverhead-Deerlodge National Forest. The fire has burned approximately 1,958 acres, all of which are National Forest System lands.

The McClusky Fire burned the head of Sage and Grouse drainages. Values at risk include critical infrastructure in roads and native vegetation communities near areas infested with noxious weeds. This BAER request funding would provide stream crossing stabilization, storm patrol and response, and weed treatments. More details on specific needs are outlined in the 2500-8.

We understand that all treatments must be completed within one year of funding approval date.

The total cost of the proposed treatments is \$55,594.

Please contact Kevin Weinner, Beaverhead -Deerlodge BAER Coordinator 406-683-3857 if you have any questions.

Cheri Ford
Forest Supervisor

CC:

Dale Olsen, Madison District Ranger
Dave Sabo, Butte/Jefferson District Ranger
Kevin Weinner, BDNF BAER Coordinator
Betsy Herrmann, BDNF Planning/Resources Staff Officer
Dori McLaughlin, BDNF Budget Officer
Vince Archer, Regional BAER coordinator
Dave Callery, Regional Hydrologist



Date of Report: 10/02/2019

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: McClusky Fire B. Fire Number: MTBDF-006289
C. State: Montana D. County: Jefferson
E. Region: R1 F. Forest: Beaverhead Deerlodge
G. District: Jefferson H. Fire Incident Job Code: P1MM6Y
I. Date Fire Started: 8/16/2019 J. Date Fire Contained: 11/1/2019
K. Suppression Cost: \$288,000

L. Fire Suppression Damages Repaired with Suppression Funds

1. Hand line 1.4 miles decommissioned

M. Watershed Number:

Middle Whitetail Creek 100200050402, Upper Big Pipestone Creek 100200050201

N. Total Acres Burned:

NFS Acres (1958 burn effects, 4404 burn perimeter) Other Federal () State () Private ()

O. Vegetation Types: Most of the burned area was dominated by conifer species, primarily Douglas fir and lodgepole pine, with sparse growth due to amount of rock and limited understory of pine grass. Meadows have a high sedge component and were wet enough to not have significant fire effects.

P. Dominant Soils:

The McClusky fire is located in the dry hills west of Butte which is composed primarily of granite. The table below lists the most common landforms in the within the fire perimeter.

MUSYM	Landform	Parent Material	Texture
75GB2	Mountain Slopes	Residuum weathered from granite	Gravelly Coarse sandy loam
75GD4	Mountain Slopes	Residuum weathered from granite	Very stony sandy loam
75GAF	Mountain Slopes	colluvium weathered from granite	Very stony sandy loam

The most dominant landform in the McClusky fire perimeter is moderately steep mountain slopes composed of decomposing granite parent material. Much of this landform is vegetated with lodgepole and Douglas fir with the majority of the lodgepole severely effected by the bark beetle epidemic. The picture below shows the general landscape within the fire perimeter.

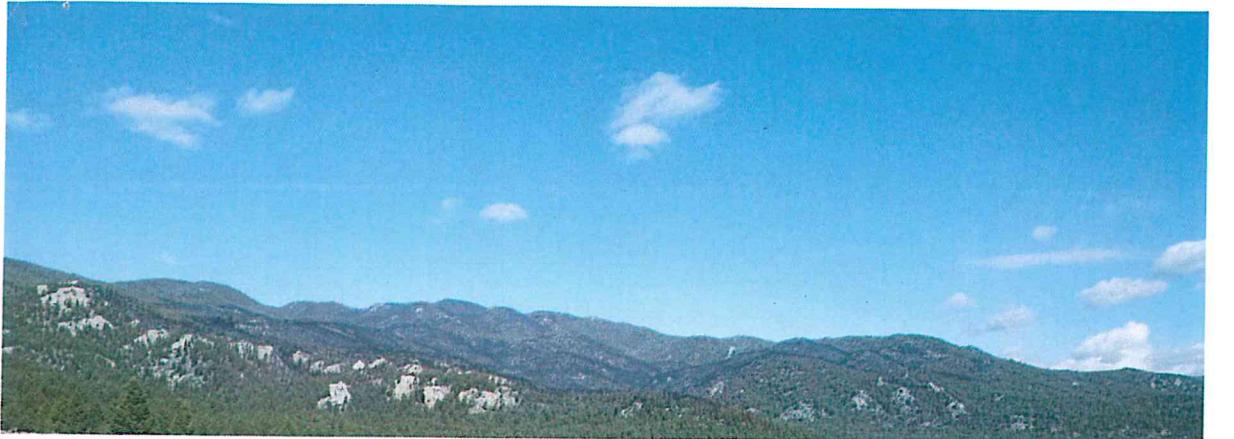


Figure 1. Landscape Common in McClusky fire perimeter

Q. Geologic Types:

Geology of the area is dominated by the Boulder Batholith, which was formed 78 to 68 million years ago. It is exposed at the surface as granite (more specifically quartz monzonite) and soils tend to be poorly developed, sandy Inceptisols.

R. Miles of Stream Channels by Order or Class:

Stream type	Miles
Perennial (1 st order)	1.7
Intermittent	10.3
Total	12.0

S. Transportation System

Trails: 0.1 miles of unauthorized trail

Roads: 1.3 mile within the fire perimeter and an additional 1.5 miles on the western boundary

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 977 (low) 975 (moderate) 6 (high)

B. Water-Repellent Soil (acres): Most high and moderate severity soils showed high degrees of water repellency. Some of the low severity soils also showed signs of water repellency. Infiltration was limited and rains mobilized soils on slopes greater than 30%. Debris flows and sand plumes were common in most drainages with significant fire effects. See example below.



Figure 2. Soils mobilized from fire effects

C. Soil Erosion Hazard Rating (acres):

111 (moderate) 1800 (moderate-high) 940 (high)

D. Erosion Potential: 10 tons/acre (based on estimated volumes generated following first event post fire)

E. Sediment Potential: 5 cubic yards / square mile (based on estimated volumes generated following first event post fire)

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period (years): 1-3 years grass and forbs, 10-15 years shrubs, 20-50 years conifers

B. Design Chance of Success (percent): 70-90%, depending on site and treatment

C. Equivalent Design Recurrence Interval (years): 50

D. Design Storm Duration (hours): 0.5

E. Design Storm Magnitude (inches): 1.48

F. Design Flow (cubic feet / second/ square mile): 90

G. Estimated Reduction in Infiltration (percent): 75 (moderate severity repellency)

H. Adjusted Design Flow (cfs per square mile): 145

Model results did not reflect observations seen on the ground. Nearly all drainages affected by the McClusky fire generated sheet flow from a long duration rain event that dropped approximately 1 inch of rain on the fire area (see figure 3 below) over a 24 hour period on September 6th. Grouse Creek which was used for the model runs at the crossing of the Whitetail road (FS 173) exceeded the capacity of the structure and ran over the road after it filled up a small pond upstream on private lands. Other ephemeral drainages all had sheet flow across the road and had to be repaired following the September storm event. The rain event was a relatively common occurrence (1 year return interval) and the area is susceptible to large thunderstorms that could generate much greater runoff events so model results may not be the best tool for analyzing effects based on what we have seen to date.



Figure 3. Sheet flow from ephemeral draw in fire affected area

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The McClusky fire generally burned in remote landscapes with limited infrastructure in the way of fire effects. This remote location vegetation consisted of lodgepole and Douglas-fir with the majority of the lodgepole severely effected by the bark beetle epidemic. The topography is generally gentle with many rock outcrops of granite bedrock throughout the area. There are a few meadows on the west side of the fire perimeter associated with the Lost Park Research Natural Area (RNA) and there were some grass parks outside of the west boundary where the private inholdings exist.

Although road networks were not common within the fire perimeter, some road networks adjacent to fire perimeters were affected and existing drainage structures are inadequate for the increased debris flow

expected from the fire effects. Short segments of roads were burned over and hazard trees are a concern for public safety.

These remote landscapes had limited invasive weed infestations within the fire perimeter but were bordered by extensive invasive weed populations that could spread into the newly disturbed areas. A number of spotted knapweed patches were observed along the Whitetail Road. Additional invasive weed populations are common across the landscape and there is a great concern that these invasive weeds may be able to utilize the newly disturbed areas and affect vegetation in the Lost Park RNA.

B. Emergency Treatment Objectives:

Treatment objectives will include addressing the fire effects on Whitetail Road and UR03N05W20-02 road which was used as the fire perimeter on the east side of the fire boundary. Almost all of the area upslope of the road has been burned and could expect fire related effects including increased runoff.

Treating weed infestation adjacent to and within burned areas of both fires will be a priority to address potential spread and reduce seed banks of noxious weeds. Application will need to be completed to ensure current infestations are addressed early and new infestations can be identified as new vegetation becomes established in burned areas.

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

Land 75% Channel 75 % Roads/Trails 75 % Protection/Safety 95 %

D. Probability of Treatment Success

		Years after Treatment		
		1	3	5
Land	75	60	50	
Channel	50	30	30	
Roads/Trails	50*	75	75	
Protection/Safety	100	90	90	

* Low due to debris flows that are expected but success of road protection is high

E. Cost of No-Action (Including Loss): \$500,000 for access to remote locations and private lands. Loss of native vegetation which could occur with noxious weed spread.

F. Cost of Selected Alternative (Including Loss): \$55,594

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Kevin Weinner

Email: kweinners@fs.fed.us Phone: 406-683-3857 FAX: 406-683-3855

H. Treatment Narrative:

(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

Land Treatments:

The interior portion of the fire is relatively weed-free. The lower portions of the fire are heavily inundated with noxious weeds. There are known infestation of spotted knapweed and toadflax in the area. During the fire, response vehicles were taken off-road for suppression activities. Handline construction opened soil reducing competition with native species. Much of the handlines were dug parallel to the main road FS 173.

The introduction of invasive species into the burned areas is a concern for most of the area. If invasive plants were to move into the area they could take over the Natural Area making it difficult to manage due to limited access. The McClusky fire has a main travel corridor, FS 173, along the East side of the fire. This access is heavily used making it a good corridor for the introduction of invasive plants from weed propagules along the road margin. Inside the burn is one two-track that enters the burn and provides a disturbance vector for weeds to spread.

On the West side of the fire is FS 8695. The road was improved by fire suppression efforts to allow access to the West side of the fire. Along the road are populations of toadflax. Road improvements may lead to the spread of invasive plants by digging and spreading weed propagules along the road margins.

The Lost Meadow research natural area falls within the burn perimeter and the threat is high given the ecological significance in the research natural area. Treatment costs in this area will be higher given its limited access but it is close enough to mapped weed infestations on the FS 8695 road to elevate risk to natural plant communities.

Risk Assessment – Threats to native plant communities within the wildfire and research natural area due to the establishment or spread of noxious weeds along fire line and roads that border the fire area.

Probability of Damage or Loss: Very Likely - Based on moderate and high burn severity and proximity to known weed infestations.

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

Risk Level: Very High – Primary risk comes spread from the existing infestations within and adjacent to burned area along with introduction of noxious weed seed from fire suppression travel off roads, digging line and road improvement. Invasive species detection surveys and treatment within and adjacent to the burned area is warranted.

Botany crews would survey the highest risk areas for noxious weeds across 325 acres is highest along the road buffers. This detection would focus on areas with very low vegetation cover despite the mapped low and moderate severity. The grassy soil and vegetation has high bare cover and thus is prone to erosion from storms. The low severity notwithstanding, the September 9th storm event showed this areas is now reactive and unstable. This disturbed state creates high invasibility for spotted knapweed and toadflax with proximate occurrence outside the burn area.

Treatment would focus on the most immediate areas near known weed populations near the firelines that paralleled the road that could spread into the burn area. Conservatively, this includes 63 acres although could change with spring emergence.

Treatment focuses primarily on fire suppression repair and secondarily addresses spread from these vectors into the natural plant communities.

Roads and Channel Treatments:

Road treatments will focus on the 1.5 miles of the Whitetail road (FS 173) which has burn effects upslope of the road. The road is a popular native surface road and the existing infrastructure is not adequate to handle the expected storm flow from the upslope fire area. A number of rolling dips were installed previous to the fire, but will need more maintenance to account for higher runoff from the fire affected area. Otherwise, there is limited road infrastructure except for the two streams crossings on Grouse and Sage Creeks. One additional crossing on a small spring does not appear to be affected by upslope fire effects. Most of the road surface treatments are consistent with a storm patrol/proofing prescription. The two crossings, however, need additional treatments since Grouse Creek has already failed following a rain event this fall.

Table 1. Road treatments

Treatment	Unit	Number	Cost/Unit	Funding
Road storm proofing	miles	2	\$4,137	\$8,274
Road storm inspection and response	miles	2	\$1,000	\$2,000
Grouse Creek culvert upsize (48" cmp) with fill	each	1	\$8,115	\$8,115
Grouse Creek crossing armoring	cy	20	\$45	\$900
Grouse Creek low water crossing overflow	each	1	\$5,600	\$5,600
Sage Creek Culvert upsize (48" cmp) with fill	each	1	\$9,615	\$9,615
Total				\$33,604

The crossings on Sage and Grouse Creek are of the greatest concern. The Grouse Creek crossing has already failed and had to be reconstructed (see figure 4). Future failures are expected on Grouse Creek due to loss of sediment retention above the crossing and possible on Sage Creek which has fewer watershed acres burned. Both have high gradient transport channels above the crossings and the crossings occur in lower gradient depositional areas where a large quantity of material is expected to be deposited as observed from the September 6th storm event. The relatively flat Grouse Creek limits the replacement culvert by road fill depth and will only be upsized to the extent feasible for the site. Since the culvert will likely not accommodate the fire exacerbated peak flow, an additional overflow low water crossing will be installed adjacent to the replaced culvert. The low water crossing will help accommodate debris flow and preserve the road prism. Crossing cleaning will need to be completed following storm events.



Figure 4. Grouse Creek Crossing Left Upstream, Right Down Stream

The Sage Creek crossing does not have as high of a risk due to fewer watershed acres affected by the fire. It is currently more than halfway filled with debris and there is evidence of significant material coming from the fire area. The most important step will be to replace the damaged partially filled culvert and replace with a larger structure. Storm inspection and response would ensure adequate cleaning to accommodate peak flows from future post fire storm events, particularly summer thunderstorms.

A low water crossing will not work at this location due to topography so we will use a channel technique to store stream bedload before it reaches the road crossing. Trees will be felled upstream in a V pattern. Though channel treatments have mixed success, this relatively cheap treatment was observed as effective in post fire settings on the Bitterroot NF.

The UR03N05W20-02 road adjacent to Sage creek which is about 0.5 miles long will also need stormproofing. The end of the road was extended for suppression activities and needs to be properly closed so the section of road is not utilized in the future by motorized traffic because it is a large source of sediment for Sage Creek. There are some burned areas on this road that will need to be cleared of hazard trees within the work areas where storm proofing needed.

Risk Assessment – Threats to stream habitat and Forest Service infrastructure from post fire flooding and debris flows.

Probability of Damage or Loss: Very Likely – A fall storm event already showed the flood potential of moderate severely burned fire area.

Magnitude of Consequence: Major – Loss of road infrastructure and access along main roads that border the fire area as well as depositing sediment into perennial streams.

Risk Level: Very High – The area has proven already high runoff rates and thus the amplified fire effects will have even greater flood potential that can damage infrastructure.

I. Monitoring Narrative:

The efficacy of treatments would be done to ensure prescribed BAER treatments meet objectives. Road treatments will be monitored for effectiveness through our normal maintenance cycle by the road crew and additional work will be completed to account for any unexpected fire effects. The monitoring funding would help track and document effectiveness for use in future years.

(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

		NFS Lands		
	Unit	# of		
Line Items	Units	Cost	Units	BAER \$
A. Land Treatments				
McClusky Fire Weed Detection	acres	8	325	\$2,600
McClusky Fire Weed Treatment	acres	280	63	\$17,640
<i>Insert new items above this line!</i>				\$20,240
<i>Subtotal Land Treatments</i>				
B. Channel Treatments				
Directional Tree Falling	each	750	1	\$750
<i>Insert new items above this line!</i>				\$750
<i>Subtotal Channel Treat.</i>				
C. Road and Trails				
RT-5 Roads Storm Proofing	miles	4,137	2	\$8,274
RT-6 Roads Storm Patrol	miles	1,000	2	\$2,000
Grouse Creek Crossing	site	13,715	1	\$13,715
Sage Creek Crossing	site	9,615	1	\$9,615
<i>Insert new items above this line!</i>				\$33,604
<i>Subtotal Road & Trails</i>				
D. Protection/Safety				
NA				\$0
<i>Insert new items above this line!</i>				\$0
<i>Subtotal Structures</i>				
E BAER Evaluation				
Assessment	days	650	5	\$3,250
				\$3,250
<i>Insert new items above this line!</i>				
<i>Subtotal Evaluation</i>				
F. Monitoring				
treatment effectivenss	days	1000	1	\$1,000
<i>Insert new items above this line!</i>				
<i>Subtotal Monitoring</i>				\$1,000
G. Totals				\$55,594
Previously approved				
Total for this request				

PART VII - APPROVALS

1. Jeff Tomec
Deputy Forest Supervisor (signature)

10-9-2019
Date

