Date of Report and Type: Initial 11/20/2017

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: Green Ridge Complex

B. Fire Number: MT-BRF-017243

C. State: Idaho

D. Counties: Idaho County

E. Region: Northern Region

F. Forest: Bitterroot NF(BRF)

G. District: West Fork RD (BRF)

H. Fire Incident Job Code: P1LBY0

I. Date Fire Started: 08/30/2017

J. Date Fire Contained: 100% as of 10/18/2017

K. Suppression Cost: $87,000 (10/18/2017)

L. Fire Suppression Damages Repaired with Suppression Funds (estimates):

1. **Dozer Fireline repaired** NA (No machine fireline)
2. **Excavator Fireline repaired** (miles): NA (No machine fireline)
3. **Other** (handline, miles): NA

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned at high and moderate severity	% of Watershed Burned
170603010405	Crooked Creek – Selway River		999	4
170603010502	Eagle Creek		1,674	10
170603010202	Lower Little Clearwater River		4	<1
170603010503	Lower Running Creek		10	<1
170603010403	Magruder Creek-Selway River		629	3

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
BITTERROOT NF	6,007
OTHER FEDERAL (LIST AGENCY AND ACRES)	0
STATE	0
PRIVATE	6,007
TOTAL	

O. Vegetation Types: Mixed pure lodgepole and mixed conifer stands. Beargrass, pinegrass and whortleberry/huckleberry understory.

P. Dominant Soils: Soils in general are poorly developed, with 0 to 2 inches of organic horizon on top of primarily cobbly silt-loam soil texture. Inclusions of unsorted glacial till also exist.

Q. Geologic Types: Idaho batholith granites. Local glaciation effects.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	
PERRENIAL	6.5
INTERMITTENT	2.8
EPHEMERAL	NA
OTHER (DITCH)	NA
TOTAL	9.3

S. Transportation System:

Trails: *National Forest (miles):* BRF – 7.6 miles *Other (miles):* 0

Roads: *National Forest (miles):* 0 miles *Other (miles):* 0

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 4: Burn Severity Acres (All BRF)

Soil Burn Severity	Total	% within the Fire Perimeter
Low	1,083	18%
Moderate	2,233	37%
High	1,430	24%
Unburned	1,261	21%
Total	**6,007**	**100%**

B. Water-Repellent Soil : 726 acres. Unfortunately, hydrophobicity testing was not able to be completed due to remote location and snowfall preventing late-season access. This analysis assumes areas of high severity do have hydrophobic properties but they are not expected to extend deeper than the top 2 cm of soil based on root characteristics and minimal changes observed in physical soil properties. Not all high severity acres will be hydrophobic, due to natural variation and rock content/cover. Based on past BAER assessments, it was assumed approximately 2/3 of the high burn severity acres are hydrophobic. (1,083 acres x .67 = 726 acres).

C. Soil Erosion Hazard Rating: 1,430 acres low, 2,233 acres moderate, 1,083 acres high (all jurisdictions, based directly on soil burn severity)

D. Erosion Potential (tons/acre): 8.6 tons/acre – high severity, (range 6.1 to 11.1 tons/acre) averaged over the first two years post-fire

The Fenn Ranger Station weather data was adjusted to climatic conditions of the Green Ridge fire perimeter with the climate interpolation program within ERMiT.

- Annual precipitation of 41 inches at 6,500 feet
- A typical hillslope lengths ranging from 300 to 1000 feet with 5 and 30 % coarse fragments
- Hillslope Gradients of 10% slope at the top and 55% slopes midway to 30% toe slope.
- Sandy Loam Texture.
- 10% exceedance probability which means that there is a 90% chance the erosion estimates will not be exceeded in a given year.

E. Sediment Potential(cubic yards/square mile): 8.6 tons/acre on 1,083 high burn severity acres = 9,314 tons. (Ermit model results, Soil Specialist Report)

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period (years): 1-3 years grass (achieve % effective ground cover), 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):6

E. Design Storm Magnitude (inches):2.5

F. Design Flow (cubic feet / second/ square mile): 15

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

H. Adjusted Design Flow (cfs per square mile): 65

PART V - SUMMARY OF ANALYSIS

Introduction/Background:
This report uses acreage derived from the September 9, 2017 BARC satellite image of 6,007 acres, all on National Forest System (NFS) lands on the Idaho portion of the West Fork Ranger District.

The Green Ridge Complex fires occurred in the central Bitterroot Mountains, west-northwest of Nez Perce pass in the Selway-Bitterroot Wilderness area. The topography of the fire area is rugged and remote, accessible only by foot or horseback. Access is also seasonally limited, with passes leading to the area staying under snow until late June or early July. Many perennial streams flow through or adjacent to the burned area, including Eagle and Crooked Creeks, which are tributary to Wild and Scenic Selway River.

The primary values at risk from post-fire effects due to the Green Ridge Complex Fire are: human life and safety around BAER implementation worksites, transportation infrastructure (trails), water quality, anadromous fish habitat, and native vegetation communities. The primary threats caused by the fire include increased runoff and accelerated hillslope erosion due to decreased infiltration rates, which is expected to be most intense the first 2-3 years following the fire until the burned watersheds start to recover. High intensity, short duration rainfall may result in accellerated erosion and localized debris flows. Additional threats include falling trees and rolling rocks from the destabilized hillslopes throughout the burned area. Post-fire erosion is expected to threaten trail stability and create potential expansion areas for invasive plant species.

A. Describe Critical Values/Resources and Threats (narrative):

Table 5: Critical Value Matrix

Probability of Damage or Loss	**Magnitude of Consequences**		
	Major	Moderate	Minor
	RISK		
Very Likely	**Very High - Native Veg/Weeds**	**Very High**	**Low**
Likely	**Very High**	**High – Trails – potential erosion/sedimentation, trail tread destabilization**	**Low**
Possible	**High - Health and Safety (falling trees) around BAER worksites (extended human presence)**	**Intermediate – fisheries – potential erosion/sedimentation**	**Low**
Unlikely	**Intermediate – Health and Safety (falling trees) on trails (transitory human presence)**	**Low**	**Very Low**

1. **Human Life and Safety (HLS):**
    a. High risk of injury from falling hazard trees around BAER implementation worksites
    b. High risk of falling hazard trees and rockfall on trails
2. **Property (P):**
    a. High risk to trail infrastructure from post-fire surface flows, for 3-5 years.
3. **Natural Resources (NR):**
    a. High risk to native plant communities from noxious weed invasion.

b. Intermediate to anadromous fish species (Chinook Salmon, Steelhead - ESA Threatened designation), Cutthroat trout (sensitive species) and Western Toads (sensitive species) from trail sediment.

4. **Cultural and Heritage Resources:** None at risk within burned area
5. **Other non-BAER Values:** None at risk within burned area

B. Emergency Treatment Objectives:

a. Reduce risk of hazard tree injury around BAER implementation worksites;
b. Inform public of risks within burned areas;
c. Protect trail infrastructure and crossings from post-fire flood flows and other potential events and maintain access;
d. Reduce the threat of significant expansion of existing noxious weeds or invasion of new noxious weeds; reduce risk to native plant communities.
e. Reduce trail sedimentation effects to native fish and amphibian habitat in Eagle and Crooked Creeks and the Selway River.

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

Land 80 percent **Channel** NA
Roads/Trails 70 percent **Protection/Safety** 80 percent

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land	80	80	75
Channel	NA	NA	NA
Roads/Trails	80	90	90
Protection/Safety	90	80	70

E. Cost of No-Action (Including Loss):$387,600

The loss of trail drainage controls (waterbars) is highly likely to increase repair costs over time, if BAER treatments are not implemented as soon as possible. The current estimate is $28,295 to treat 7.6 miles of trail. If the treatments are not implemented, and assuming 50% of the trails in high and moderate burn severity are severely damaged over the next 5 years and require full tread rebuilding with waterbars, the cost would be 3.8 miles x $15,000 cost/mile (about $3/foot), for a total or about $57,000.

The wildfires created conditions conducive to noxious weeds spread and establishment by reducing competition, exposing bare mineral soil, and creating an environment where fall nutrient availability (water and soil nutrients) goes to the fall growth period for noxious weeds and not native plants which are mostly dormant at this time. This equates to a 1.0 probability of new noxious weed invasions and spread if left untreated (very likely and with major consequences).

Having noxious weeds establish and spread (at the generally accepted rate of 14% per year) will reduce native forage and cover for wildlife species, increase sediment deliver to streams (reduction of fisheries habitat), and reduce the recreational value of the greater Green Ridge Complex Fire area. All of these aspects have a “non-market forest benefit”, non-market forest benefit loss, that would be apparent to the users of the Green Ridge Complex Fire area (including the Selway-Bitterroot Wilderness Area) within a decade should these sites go untreated. It is estimated that noxious weed infested acres would double in five years if left untreated.

If Early Detection/Rapid Response (EDRR) treatments were funded, we would expect a reduction of noxious weed along the trail vectors by 85% which would still leave a probability of 15% of a new invasive species establishing in the open, south facing slopes and within special interest areas from a human element and a potential of 14% per year establishment and spread from wind, wildlife, and noxious weed

population growth. The open, south facing slopes would still be left untreated facing a 14% growth rate. The cost projections for the values at risk would increase by 20 times. This would increase weed control costs from $16,530 (Invasives treatment total cost estimate minus awareness sign costs) to $330,600.

The estimated cost of no action is therefore $57,000 trails and $330,600 weeds for a total of **$**387,600 after 5 years of no treatment.

F. Cost of Selected Alternative (Including Loss):$46,919

G. Skills Represented on Burned-Area Survey Team:

☒ Archaeology	☒ Botany	☐ Ecology	☐ Economist	☐ Engineering
☐ Fisheries	☐ Forestry	☒ GIS	☒ Hydrology	☐ Range
☒ Recreation	☒ Soils	☒ Team Lead	☐ Wildlife	☐
☐	☐	☐	☐	☐

Team Leader: Ed Snook
Email:esnook@fs.fed.us Phone:406.363.7103 FAX: 406.363.7106

Forest BAER Coordinator: Ed Snook
Email: esnook@fs.fed.us **Phone:**406-363-7103

Core Team Members:

Table 7: BAER Team Members by Skill

Skill	Team Member Name
Team Lead	Ed Snook
Archaeology	Matt Werle
Botany/Invasive Species	Gil Gale
Ecology	NA
Economist	NA
Engineering	NA
Fisheries	NA
Forestry	NA
GIS	Nathan Teats
Hydrology	Ed Snook
Range	NA
Recreation/Trails	Mark Smith
Soils	Cole Mayn
Wildlife	NA

H. Treatment Narrative:Land Treatments:

Noxious Weeds Control/Treatment – Treatments BRF_LT_1

Objective:

The purpose of the treatment is to maintain ecosystem integrity within the Green Ridge Complex Fire and Selway-Bitterroot Wilderness Area, where few noxious weed populations currently exist. This burned area is particularly important due to known rush skeletonweed sites recently established to the west (upwind) that are capable of seeding into the burned sites. Without treatment, rush skeletonweed and other new invaders, weeds may spread into the severely burned areas. By reducing the amount of weed seed along trails in the area, native species will have an opportunity to take advantage of the post-fire nutrient flush without competition from noxious weeds. EDRR will be used to minimize the potential for new noxious weed infestations and ensure the natural recovery of native perennial grasses and forbs. This treatment will also help maintain soil stability, hydrologic function, and biotic integrity associated with native species.

Methods:

As Early Detection/Rapid Response (EDRR) protocols and survey results direct, survey and treat noxious weeds with appropriate herbicides, as needed along fire access road corridors that provide routes invasive weed species could use to expand into the high and moderate burn severity areas. Selected sites include spraying along trails where heavy canopy loss has increased the risk of rush skeletonweed, knapweed and other species spreading into formerly weed-free areas within the fire. Disturbed ground from trail stabilization is a potential weed vector and would also be a priority. Effects of herbicide treatments are addressed in invasive species decisions. Signs at trailheads would be installed to reduce noxious weed spread and encourage users to stay on trails.

Table 8: Bitterroot NF Weeds EDRR Treatment Types and Cost

TREATMENT DESCRIPTION	TARGET WEED SPECIES	ESTIMATED ACRES	COST PER ACRE	COST	TIMING
EDRR SUPPRESSION IMPACTS- **NONMOTORIZED TRAILS** IN HIGH AND MODERATE SOIL BURN SEVERITY	Rush skeletonweed, yellow toadflax, houndstongue, leafy spurge, and spotted knapweed.	119	$120	$14,280	Spring
REVEGETATE HIGH-PRIORITY SITES WITH NATIVE SPECIES	Same as above	15	$150	$2,250	Spring
WEED PREVENTION STATIONS (BOOT BRUSH STATIONS)	Same as above	1 (units)	$1,250 per unit	$1,250	Spring
TOTAL				**$17,780**	

Road and Trail Treatments:

Stabilize Wilderness Trails – Treatments BRF_RT_1

Objective:

Objectives include protection of trail infrastructure during large hydrologic events and reduce potential for trail erosion.

Methods:

At candidate sites in high and moderate burn severity, install trail waterbars, dips or outsloped segments. Clear leadout ditches where necessary to promote drainage, and armor drain outlets where needed. Use horse packer for crew supplies as needed.

Table 9: Bitterroot Wilderness NF Trail Stabilization Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
STABILIZE WILDERNESS TRAILS	Miles	$3,723	7.6	$28,295

Protection/Safety Treatments:

Trail Warning Signs – Treatments BRF_PS_1

Objective:
Inform the public of potential post-fire risks to trail user safety. These include hazard trees, stump holes, eroded trail surfaces, rock fall and unstable tread.

Methods:
Install warning signs to warn users of increased risks due to the fire.

Table 10: Bitterroot NF Trail Warning Signs Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TRAILS – WARNING SIGNS	each	$282	3	$846

I. Monitoring Narrative: NA

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Bitterroot National Forest

			NFS Lands				Other Lands			All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
LT-1 Nox Weed Control	each	17,780	1	$17,780	$0		$0		$0	$17,780
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$17,780	$0		$0		$0	$17,780
B. Channel Treatments										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
RT-1 Stabilize Wilderness Trails	miles	28,295	1	$28,295	$0		$0		$0	$28,295
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$28,295	$0		$0		$0	$28,295
D. Protection/Safety										
PS-1 Trails Warning Signs	each	282	3	$846	$0		$0		$0	$846
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$846	$0		$0		$0	$846
E. BAER Evaluation										
Initial Assessment	Report	$1,400	1	---	$1,400		$0		$0	$1,400
				$0	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$0	$1,400		$0		$0	$1,400
F. Monitoring										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$46,921	$1,400		**$0**		**$0**	**$48,321**
Previously approved										
Total for this request				**$46,921**						

PART VII - APPROVALS

1. _____ 11/XX/2017
Julie King, Bitterroot Forest Supervisor Date

2. _____ /2017
Leanne Marten, Region 1 Regional Forester Date

Figure 1: Green Ridge Complex Fire - Soil Burn Severity Map