

Date of Report and Type: Initial 8/14/2018

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: Reynolds Lake Fire

B. Fire Number: MT-BRF-18084 LOWN (0103)

C. State: Montana, Idaho

D. Counties: Ravalli County (MT), Lemhi County (ID)

E. Region: Northern Region

F. Forest: Bitterroot N.F., Salmon-Challis N.F.

G. District: West Fork RD (Bitterroot N.F.), North Fork RD (Salmon-Challis N.F.)

H. Fire Incident Job Code: P1LOWN (0103)

I. Date Fire Started: 07/17/2018

J. Date Fire Contained: 100% as of 7/30/2018

K. Suppression Cost: approx. \$3 million

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): approx. 7

M. Watershed Numbers:*Table 1: Acres Burned by Watershed*

6th HUC Name	HUC ID Number	Total HUC acreage	Unburned w/in fire perimeter	Low	% of HUC	Moderate	% of HUC	High	% of HUC	Grand Total
Deer Creek	170102050101	14528.0	78.8	105.8	0.7	425.7	2.9	110.7	0.8	720.9
Reynolds Creek	170602070102	11166.0	25.7	34.4	0.3	29.0	0.3	0.3	0.0	89.4
Grand Total			104.5	140.2		454.7		111.0		810.3

N. Total Acres Burned:*Table 2: Total Acres Burned by Ownership**

OWNERSHIP	ACRES
BITTERROOT NF	720.9
SALMON-CHALLIS NF	89.4
STATE	0
PRIVATE	
TOTAL	810.3

*InciWeb lists the Reynolds Lake Fire as being 1,068 acres in size. The fire perimeter and BARC image, however, show only 810 acres. Use of an alternate fire perimeter by fire management and BAER assessment personnel may be one source of error.

- O. Vegetation Types:** Pure lodgepole and mixed conifer stands. Beargrass, pinegrass and whortleberry/huckleberry understory.
- P. Dominant Soils:** Poorly developed, coarse textured soils with thin (one inch or less) organic enriched horizons. A layer of volcanic ash measuring approx. 2 to 5 inches in depth was observed throughout the burned area.
- Q. Geologic Types:** Predominantly Idaho batholith granite with isolated pockets of glacial till and alluvium in the headwaters of Deer Creek.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class. Miles are based on NHD 24k mapping within the burn perimeter. Greater stream channel extent of all flow classes was observed during field reconnaissance, but accurate representation of this channel length is beyond the scope of this assessment.

STREAM TYPE	
PERENNIAL	0.8
INTERMITTENT	0.1
EPHEMERAL	
OTHER (DITCH)	
TOTAL	0.9

S. Transportation System:

Trails: National Forest (miles): 0.4 miles

Roads: National Forest (miles): 2.5 miles

A. Burn Severity (acres):

Table 4: Burn Severity Acres

Soil Burn Severity	Total	% within the Fire Perimeter
Low	140	17%
Moderate	455	56%
High	111	13%
Unburned	105	13%
Total	811	100%

- B. Water-Repellent Soil** : 566 acres (all area burned under moderate and high severity were observed to express moderate to strong water repellency within approximately 2 cm of the soil surface.
- C. Soil Erosion Hazard Rating**: 140 acres low, 455 acres moderate, 111 acres high (based directly on soil burn severity)
- D. Erosion Potential**: As high as 16.6 tons/yr (WEPP PEP output. Note that years 1-2 immediately post fire are not included in output.)
- E. Sediment Potential**: As high as 17.7 tons/ac for a 5-year recurrence interval (20% probability) sediment yield event (WEPP PEP output).

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): 10 year post-fire
- D. Design Storm Duration** (hours): 6 hr and 24 hr*
- E. Design Storm Magnitude** (inches): 1.7 and 2.6
- F. Design Flow** (cubic feet / second/ square mile): 31**
- G. Estimated Reduction in Infiltration** (percent): 69 (high and moderate severity)***
- H. Adjusted Design Flow** (cfs per square mile): 52.7

*Actual model input was an SCS Type II rainfall distribution, which captures shorter duration events. **Mean estimated post-fire peak flow. ***Percent of burned area approximated as have some soil water repellency.

PART V - SUMMARY OF ANALYSIS

Introduction/Background:

Initial assessment of the lightning-caused Reynolds Lake Fire identified a limited number and type of FS Values at Risk post-fire. Commensurate with scope and complexity of identified FS values at risk, the Reynolds Lake BAER assessment consisted of a focused effort with few ID team members. Identified FS critical values were assessed for risk of loss and potential treatments were explored. In accordance with Forest Service Manual, the risk matrix (Table 1: Exhibit 2 of Interim Directive No.: 2520-2010-1) was used to evaluate the risk level for potential loss or impairment of FS Values at Risk.

Table 1. BAER Risk Assessment Matrix (WO Interim Directive 2523.1- Exhibit 02).

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 one to three years (depending on the resource):

Very likely - nearly certain occurrence (>90%)

Likely - likely occurrence (>50% to < 90%)

Possible - possible occurrence (>10% to <50%)

Unlikely - unlikely occurrence (<10%)

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 natural or cultural resources resulting in minimal, recoverable or localized effects.

The lightning-caused Reynolds Lake Fire fell in a remote part of the Bitterroot N.F. on the Montana-Idaho border north of Woods Creek Pass. A portion of the fire burned into the Frank Church/River of No Return Wilderness. Ground access to the fire was limited to exclusively Forest Road 044, which is under the jurisdiction of the Salmon-Challis National Forest. The 044 road provides access to multiple trails and trailheads, including the Reynolds Lake trailhead, Razorback Ridge Trail #106, and the Deer Creek Trailhead (accessed via FR 1381, under Bitterroot N.F. jurisdiction). Multiple large, stand replacing fires have burned in the immediate vicinity within the past 10 years, include the Saddle and Mustang Fires.

Out of concern for risk to public safety and infrastructure in the upper West Fork watershed, the fire was fought aggressively and contained following approximately a week of active fire behavior. The fire was largely wind-driven, and as is typical of such fires in the northern Rockies, soil burn severity effects were disparate with burn intensity; soils falling under forest vegetation that burned under high intensity tended to display characteristics typical of moderate soil burn severity. Soils within the burn perimeter are currently expressing strong water repellency near the soil surface, which exacerbates the potential for robust watershed response within the next couple of years (See Soils and/or Hydrology Reports for further detail). The final soil burn severity map can be found in Figure 1 below.

With the majority of the fire having burned on the Bitterroot N.F., BAER values at risk were also focused on the Bitterroot. Bitterroot N.F. BAER personnel coordinated with their BAER counterparts and Salmon-Challis line officers to ensure that concerns were addressed as needed. As the Reynolds Lake Fire BAER assessment coalesced, it became apparent that there were no Values at Risk on the Salmon-Challis N.F. that warranted treatment under BAER authority.

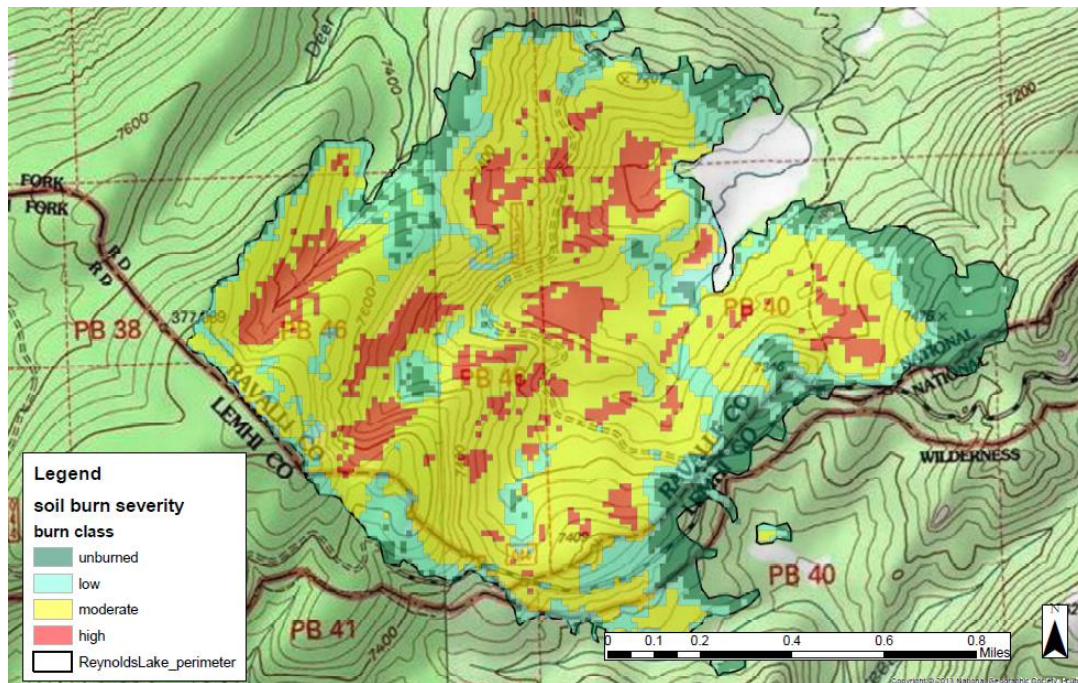


Figure 1. Final soil burn severity map for the Reynolds Lake Fire.

A. Describe Critical Values/Resources and Threats:

1. Human Life and Safety (HLS):

- a. **High risk** of injury (*Possible, Major*) from falling hazard trees along the Razorback Ridge Trail # 106
- b. **Intermediate risk** of injury (*Unlikely, Major*) resulting from forest visitors encountering road washout along FR 1381 without warning

2. Property (P):

- a. **High risk** to trail infrastructure (*Likely, Moderate*) from post-fire surface flows for 3-5 years
- b. **Intermediate risk** to road infrastructure (*Possible, Moderate*) from debris-bulked peak flows for 2-3 years

3. Natural Resources (NR):

- a. **High risk** (*Possible, Major*) to native plant communities from noxious weed invasion.
- b. **Low risk** (*Possible, Minor*) to native fisheries habitat from sediment inputs due to post-fire runoff and/or peak flows

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. Reduce the threat of significant expansion of existing noxious weeds or invasion of new noxious weeds; reduce risk to native plant communities.

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): \$12,900

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 \$1,300 to treat 0.3 miles of trail. If the treatments are not implemented, and assuming the at-risk trail segment requires full tread rebuilding with waterbars, the cost would be 0.3 miles x \$15,000 cost/mile (about \$3/foot), for a total of about \$4,300.

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 high 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 and reduce the recreational value of the greater Reynolds Lake 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 Reynolds Lake Fire area within a decade should these sites go untreated.

If Early Detection/Rapid Response (EDRR) treatments are not funded, noxious weeds may establish and potentially take multiple years post-establishment to be detected. Assuming a 14% per year establishment and spread rate from wind, wildlife, and humans, contract cost of weed treatment (backpack treatment at \$120/acre) could be as much as \$8,400 after 5 years.

F. Cost of Selected Alternative (Including Loss): \$4,182**G. Skills Represented on Burned-Area Survey Team:**

- | | | | | |
|---|--|---|---|--------------------------------------|
| <input checked="" type="checkbox"/> Archaeology | <input checked="" type="checkbox"/> Botany | <input type="checkbox"/> Ecology | <input type="checkbox"/> Economist | <input type="checkbox"/> Engineering |
| <input type="checkbox"/> Fisheries | <input type="checkbox"/> Forestry | <input type="checkbox"/> GIS | <input checked="" type="checkbox"/> Hydrology | <input type="checkbox"/> Range |
| <input checked="" type="checkbox"/> Recreation | <input checked="" type="checkbox"/> Soils | <input checked="" type="checkbox"/> Team Lead | <input type="checkbox"/> Wildlife | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Team Leader: Andy Efta

Email: jefta@fs.fed.us **Phone:** 406.363.7103 **FAX:** 406.363.7106

Forest BAER Coordinator: Andy Efta

Email: jefta@fs.fed.us

Phone: 406-363-7103

Core Team Members:

Table 7: BAER Team Members by Skill

Skill	Team Member Name
<i>Team Lead</i>	Andy Efta
<i>Archaeology</i>	Matt Werle
<i>Botany/Invasive Species Ecology</i>	Diane Bessler-Hackett

Skill	Team Member Name
<i>Economist</i>	
<i>Engineering</i>	
<i>Fisheries</i>	Mike Jakober
<i>Forestry</i>	
<i>GIS</i>	
<i>Hydrology</i>	Andy Efta
<i>Range</i>	
<i>Recreation/Trails</i>	Mark Smith, Deb Gale
<i>Soils</i>	Cole Mayn
<i>Wildlife</i>	

H. Treatment Narrative: Land Treatments:**Noxious Weeds Early Detection/Rapid Response****Objective:**

The purpose of the treatment is to maintain ecosystem integrity within the Reynolds Lake Fire, where few noxious weed populations currently exist. This burned area is particularly important due to known rush skeletonweed sites recently established on the southern part of the West Fork R.D. that are capable of seeding into burned sites. EDRR will be used to minimize the potential for new noxious weed infestations and ensure the natural recovery of native perennial grasses and forbs.

Methods:

Surveys for noxious weeds would occur along fire access road corridors that provide routes for invasive weed species to expand into high and moderate burn severity areas. Disturbed ground from trail stabilization is a potential weed vector and would also be a priority for monitoring. In absence of existing weed infestations within or directly adjacent to the burn perimeter, no funding is being requested for weed spraying at this time. Should weeds be discovered within one year following fire containment, an interim request will be filed to fund labor and materials for weeds treatment.

Table 8: Bitterroot NF Weeds EDRR Treatment Types and Cost

TREATMENT DESCRIPTION	TARGET WEED SPECIES	UNIT DAILY COST*	NUMBER OF DAYS	COST	TIMING
EARLY DETECTION OF WEEDS SPREAD INTO BURNED AREA	Rush skeletonweed, yellow toadflax, houndstongue, leafy spurge, and spotted knapweed.	\$500	4	\$2,000	Spring
TOTAL				\$2,000	

*Unit daily cost includes cost of one GS-07 permanent seasonal technician, one GS-05 seasonal technician, and daily travel/vehicle costs.

Road and Trail Treatments:**Stabilize Razorback Ridge Trail #106****Objective:**

Objectives include protection of trail infrastructure during significant rainfall events and reduction of 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.

Table 9: Bitterroot Wilderness NF Trail Stabilization Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
STABILIZE TRAILS	0.3 miles	\$1,618.00	1	\$1,618.00

Protection/Safety Treatments:**Trail Warning Signs****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	2	\$564

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										
Noxious Weeds Early Detection Monitoring	each	2,000	1	\$2,000	\$0		\$0		\$0	\$2,000
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$2,000	\$0		\$0		\$0	\$2,000
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										
Stabilize Trails	0.3 miles	1,618	1	\$1,618	\$0		\$0		\$0	\$1,618
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Road and Trails				\$1,618	\$0		\$0		\$0	\$1,618
D. Protection/Safety										
Trails Warning Signs	each	282	2	\$564	\$0		\$0		\$0	\$564
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Protection/Safety				\$564	\$0		\$0		\$0	\$564
E. BAER Evaluation										
				---	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				\$0	\$0		\$0		\$0	\$0
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				\$4,182			\$0		\$0	\$4,182
Previously approved										
Total for this request				\$4,182						

PART VII - APPROVALS

1. /s/ Julie King 08/14/2018
Julie King, Bitterroot Forest Supervisor Date

2. /s/ Leanne M Marten 08/15/2018
Leanne Marten, Region 1 Regional Forester Date