

**Date of Report:****BURNED-AREA REPORT****PART I - TYPE OF REQUEST****A. Type of Report**

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

**B. Type of Action**

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
- ☐ 2. Interim Request # \_\_\_\_\_
- ☐ Updating the initial funding request based on more accurate site data or design analysis

**PART II - BURNED-AREA DESCRIPTION****A. Fire Name:** Granite Pass Complex**B. Fire Number:** MTLNF-00962**C. State:** Montana, Idaho**D. County:** Clearwater, Idaho and Missoula, Montana**E. Region:** R1**F. Forest:** Lolo National Forest, Nez Perce Clearwater National Forest**G. District:** Missoula (LNF), Lochsa/Powell (NCF)**H. Fire Incident Job Code:** P1N5N521**I. Date Fire Started:** 7/7/21**J. Date Fire Contained:** 9/16/2021**K. Suppression Cost:** \$10.5 million**L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

1. Fireline repaired (miles): 5.7 miles dozer, 5.9 miles hand, 4.5 miles excavator. Cost \$1,514,000 (estimate)
2. Other (identify):

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

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170603030105	Fox Creek-Boulder Creek	16032	748	4
170102051403	Granite Creek	13113	389	3
170603030106	Lower Crooked Fork	21112	100	1
170603030104	Upper Crooked Fork	19448	3587	18
170102051401	West Fork Lolo Creek	10680	911	9

**N. Total Acres Burned:**5736

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	5191
OTHER FEDERAL (LIST AGENCY AND ACRES)	
STATE	
PRIVATE	546
TOTAL	5736

**O. Vegetation Types:**

The dominant vegetation type in general on both the Nez Perce-Clearwater and the Lolo National Forest is Lodgepole pine and Subalpine fir habitat types. Included in this are Lodgepole Pine/Conifer mix and Subalpine fir/Conifer mix habitat types.

**P. Dominant Soils:**

The dominant soil types on the Nez Perce-Clearwater NF portion of the fire generally consists of surface mixed ash cap silt or sandy loams. The soil classifications are Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryochrepts, loamy-skeletal, mixed. Soil profiles are 30 to 48 inches deep and are droughty. Surface soil is mixed volcanic ash. Subsurface soil is coarse textured and has 20 to 60% rock fragments. Other land type units will have profiles ranging over 60 inches deep, with 30 to 50% rock fragments.

The dominant soil types on the Lolo NF portion of the fire generally consists of well-drained and moderately coarse soils with surface layers formed in volcanic ash influenced loess. Subsoils may contain 65 to 95 percent rock fragments. A typical classification is Andic Cryochrepts, loamy skeletal, mixed with surface layers that are dark brown, very gravelly silt loams. Subsoils are brown extremely cobbly sandy or silt loams. Other dominant soils are somewhat excessively drained and moderately coarse, with subsoils containing 55 to 90 percent rock fragments and depths varying from shallow to moderately deep. A representative profile for this Cryochrept will have surface layers that are light yellowish-brown loam and light gray extremely gravelly coarse sandy loam subsurface layers.

**Q. Geologic Types:**

The dominant geologic type for the Nez Perce-Clearwater NF within the Fire Perimeter is listed as Undifferentiated (79%) and Gruss, Granitics (13%). The Undifferentiated consists of mapping units where the type of parent material did not influence the interpretative criteria within the Land System Inventory for unit mapping. These are high elevation units where chemical weathering is weak and most interpretive criteria are influenced by mechanical weathering. Grussic granitics consists of thin soils overly deeply weathered, coarse textured parent materials (Grussic Idaho Batholith Granites).

Nez Perce-Clearwater NF Geologic Types	Percent within Fire Perimeter
Undifferentiated	79%
Gruss, Granitics	13%
Glacial Till	7%
Quartzites	0%
Alluvium	0%

The dominant geologic type for the Lolo NF within the Fire Perimeter is listed as Granitics and associated rocks of the Idaho Batholith (41%) and Undifferentiated metasedimentary rocks and granitics. Granitics and associated rocks contain parent material derived from granitic bedrock of the Idaho Batholith and other minor granitic intrusions. The undifferentiated group contains parent materials derived from Belt Supergroup metasedimentary rocks or weakly weathered granitic rocks. These materials include alluvium on terraces and floodplains; shallow soils on flood scoured footslopes and stream breaklands; strongly frost churned broadly convex ridges; and glacial outwash on plains.

Lolo NF Geologic Types	Percent within Fire Perimeter
Granitics and associated rocks of the Idaho Batholith	41%
Undifferentiated metasedimentary rocks and granitics	32%
Moderately well weathered granitics	11%
Moderately weathered granitics	6%
Glacial till - derived from granitics	6%
Moderately weathered granitics-bouldery phase	2%
Moderately well weathered granitics-bouldery phase	1%

## R. Miles of Stream Channels by Order or Class: 12.9 total miles

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	6.4
INTERMITTENT	6.5
EPHEMERAL	
OTHER (DEFINE)	

## S. Transportation System:

**Trails:** *National Forest (miles):* 69 total miles

Nez Perce-Clearwater NF (45.3) 36.6 miles are a snow route

Lolo NF (23.7) 9.85 miles are a snow route

**Roads:** *National Forest (miles):* 27.9 total miles

Nez Perce-Clearwater NF (16.5)

Lolo NF (9.1)

**Other (miles):**

Non FS ID (2.2)

Non FS MT (0.1)

## PART III - WATERSHED CONDITION

## A. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	Other Federal (List Agency)	State	Private	Total	% within the Fire Perimeter
Unburned	883			83	966	17
Low	1980			181	2161	38
Moderate	1801			215	2016	35
High	527			66	593	10
Total	5190			546	5736	100

## B. Water-Repellent Soil (acres): 1601 acres

Soils were tested for hydrophobicity throughout the Granite Pass Complex burned area to assess the level of water repellency. Under unburned conditions, soils within the fire perimeter exhibited naturally weak to strong hydrophobicity, especially where soil drying is common during hot, dry summer months and areas of naturally high surface organic matter. Within the burned area, all high severity burned areas and roughly half of the moderate severity burned areas showed moderate to strong water repellency, with a rough total of 1601 acres. Numerous rainstorms that helped moderate fire behavior and growth through the duration of the fire, also assisted in the breakdown of surface water repellency in areas, so not all areas had surface hydrophobicity.

However, generally, throughout the area water repellency occurred from the surface, or within 1 cm of surface to depths ranging down to 8-10 cm. As stated, a fair amount of natural water repellency was noted in the unburnt areas, making it difficult to determine, how much water repellency the fire created, or made stronger.

### C. Soil Erosion Hazard Rating:

Soil Erosion Hazard acres were determined from the Landtype System Inventory surface erosion classifications (Low, Moderate, High) for each forest and intersected with soil burn severity mapping units. Areas with High soil burn severity were placed into the high-risk category. Areas with moderate natural surface erosion risk, combined with High soil burn severity were also given a high erosion risk hazard.

Soil Erosion Hazard Acres		Low	Moderate	High
Nez Perce-Clearwater NF	Pre-Fire	2283	519	1629
	Post-Fire	1383	640	2408
Lolo National Forest	Pre-Fire	0	1301	0
	Post-Fire	0	1246	55

### D. Erosion Potential:

Based on WEPP-PEP and ERMiT modeling of the Granite Pass Complex Fire Area, input from a representative watershed within fire area developed a total of 73 hillslopes (2618 acres) for the ERMiT model input. The table below shows the untreated 1<sup>st</sup> year after fire average tons/acre for different target probabilities. The two-year untreated average is 5.74 tons/acre.

Soil erosion potential is higher in the Granite Pass Complex area than many other areas based on slope steepness, limited effective ground cover, and underlying soil parent material. In this area granite, gneiss, and mica schists are the underlying parent materials which result in more fine soil movement associated with preferential flow around coarse rock fragments. As vegetation re-establishes within the fire area, erosion potential is expected to diminish.

Probability	Average (tons/acre)
10%	24.33
30%	15.04
50%	9.68
75%	6.73

The data entered into the ERMiT model includes climate, soil texture, rock content of the soil profile, vegetation type (forest, range, or chaparral), hillslope gradient and horizontal length, and soil burn severity. The climatic data for the Granite Pass Complex was modified using the PRISM function to adjust climate data. Assumptions for modeling parameter inputs are:

Primary Climate Location: Stevensville, MT  
Prism Adjustments: 46.64° N 114.6° W at 5409 ft elevation  
Vegetation: Forest  
Soil Texture: Silt Loam  
Rock Content: 35%  
Gradient of top: varied by hillslope  
Gradient of middle 80% of hillslope: varied by hillslope  
Gradient of hillslope toe: varied by hillslope  
Soil burn severity class: unburned, low, moderate, or high

**E. Sediment Potential:** 3277 yds<sup>3</sup>/mi<sup>2</sup> (averaged over first 2 years)

**F. Estimated Vegetative Recovery Period (years):** 1-3 years for effective grass ground cover, 10-15 years for shrubs, and 20-50 years for conifers

**G. Estimated Hydrologic Response (brief description):** The Granite complex fire was moderated by persistent august rainfall. The fire never gained enough momentum to make large runs or burn large swaths of land at a high soil burn severity. Most of the fire was in the low to moderate soil burn severity. And the high soil burn severity areas were not as high as soil burn severity on other fires.

It is unlikely that any of the major stream channels in the fire area will see increased peak of flashy flows from the fire due to the low percentage of watershed areas that burned. There will be some localized increases in runoff which will impact existing infrastructure. This request is intended to project that infrastructure.

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

### **Introduction/Background**

The Granite Pass complex consists of four separate fires: The Boulder Creek Fire, Shotgun Fire, BM Hill Fire, and the Lolo Creek Fire. The Boulder Creek and Shotgun fires burned exclusively on the Nez Perce-Clearwater NF in Idaho. The BM Hill fire burned on both the Lolo and Nez Perce-Clearwater NFs in Idaho and Montana. The Lolo Creek fire burned on the Lolo NF in Montana.

The fires started via a lightning storm in early July. They burned in the granitic bedrock and soils of the Idaho Batholith. The topography of the burned area is generally rugged with many steeply sloped valleys. The fire burned in headwater areas of West Fork Lolo Creek and Granite Creek in Montana. The fires burned in headwaters and through riparian zones of the Crooked Fork, Shotgun, and Boulder Creek in Idaho, all of which drain into the Lochsa River.

The fires were originally predicted to threaten several residences and business in Montana as well as impact commercial traffic on Highway 12. However, significant weekly rain events starting the first week of August led to decreased fire activity and the burned area was mainly on the Idaho side of the border.

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

*Table 5: Critical Value Matrix*

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	<b>RISK</b>		
Very Likely	<b>Very High</b>	<b>Very High</b>	<b>Low</b>
Likely	<b>Very High</b>	<b>High</b>	<b>Low</b>
Possible	<b>High</b>	<b>Intermediate</b>	<b>Low</b>
Unlikely	<b>Intermediate</b>	<b>Low</b>	<b>Very Low</b>

- 1. Human Life and Safety (HLS):** There is a high risk to members of the public of USFS employees accessing areas in the Granite Pass Complex via the road system. The probability of damage or loss is possible to likely and the magnitude of consequences is major to moderate. The consequences are major on roads with burned out plastic pipes. **The recommended treatment is hazard signage and stormproofing on open road systems and removal of burned plastic pipes on the administrative road (43110).**
- 2. Property (P):** There is a high risk to roads 9942, 16675, and 43110 on the LNF and road 595 on the NCNF. There is also a high risk to a culvert on the 595 road on the NCNF. Probability of damage is likely and magnitude of consequences is moderate. **Recommended treatment is hazard signage, storm proofing along 4 miles of road, and removal of burned plastic culverts.**

- 3. Natural Resources (NR):** There are risks to water quality and bull trout habitat for increased sedimentation from the 9942, 43110, and 16675 roads on the LNF. The water quality risks are to 303d listed streams in Montana (West Fork Lolo Creek and Granite Creek). The risk levels are from very high to low, with very likely probability of damage and minor to moderate magnitude of consequences. There are risks to water quality from the 592 and 5672 roads on the NCNF. The risk levels are high to intermediate, the probability of damage is possible to likely, and the magnitude of consequences are moderate. **Recommended treatment is stormproofing and culvert protection on the 595, 16675, and 9942 roads, removal of plastic culverts on the 43110 road, and storm patrol on the 5672 roads.**

**4. Cultural and Heritage Resources: none**

- B. Emergency Treatment Objectives:** The objectives of the proposed treatments are to: warn the public about potential safety hazards along open road systems, protect investments in the road system, and to decrease potential for increased road sedimentation into stream systems.

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

Land: None

Channel: None

Roads/Trails: 90%

Protection/Safety: 90%

**D. Probability of Treatment Success**

Table 5: Probability of Treatment Success

	<b>1 year after treatment</b>	<b>3 years after treatment</b>	<b>5 years after treatment</b>
<b>Land</b>	n/a	n/a	n/a
<b>Channel</b>	n/a	n/a	n/a
<b>Roads/Trails</b>	90	80	80
<b>Protection/Safety</b>	90	90	90

- E. Cost of No-Action (Including Loss): \$149,000** see engineer report for details

**F. Cost of Selected Alternative (Including Loss):**

- **Lolo NF**
  - Road hazard signs (\$800) + Storm inspection and Response (\$4520) + Storm Proofing (\$8100) + New Drain Dips (\$1600) + Plastic Culvert Removals (\$29700)
  - **\$40,520 total for Lolo NF**
- **Nez Perce Clearwater NF**
  - Road hazard signs (\$800) + Storm inspection and Response (\$6780) + Storm Proofing (\$3600) + New Drain Dips (\$1200) + Stream Crossing Protection (\$1400)
  - **\$13,780 total for Nez-Clearwater NF**
- **\$54,300 total for all treatments on both forest**

**G. Skills Represented on Burned-Area Survey Team:**

- ☒ Soils      ☒ Hydrology      ☒ Engineering      ☒ GIS      ☒ Archaeology  
☒ Weeds      ☒ Recreation      ☐ Fisheries      ☐ Wildlife  
☐ Other:

**Team Leader:** Dustin Walters/Jeremy Back

**Email:** [dustin.walters@usda.gov](mailto:dustin.walters@usda.gov)

**Phone(s)** (406) 552-9535

**Forest BAER Coordinator:** Ann Hadlow

**Email:** [ann.hadlow@usda.gov](mailto:ann.hadlow@usda.gov)

**Phone(s):** (406) 626-5402

**Team Members:** Table 6: BAER Team Members by Skill

<b>Skill</b>	<b>Team Member Name</b>
<i>Team Lead(s)</i>	Dustin Walters/Jeremy Back
<i>Soils</i>	Jeremy Back
<i>Hydrology</i>	Dustin Walters/Erin Grinde (trainee)
<i>Engineering</i>	Brian Story/Callie Hunt
<i>GIS</i>	Nat Johnson
<i>Archaeology</i>	Sydney Bacon
<i>Weeds</i>	Karen Stockman
<i>Recreation</i>	Katie Knoteck
<i>Other</i>	

## H. Treatment Narrative:

**Land Treatments: none**

**Channel Treatments: none**

### **Roads and Trail Treatments:**

R1. Storm Proofing (storm proofing existing drainage features): Storm proofing is requested along open public roads and one administrative road to protect infrastructure from potential loss during increase post fire runoff. A total of 5 mile of storm proofing is requested. Four miles on the Lolo NF at \$2,025 a mile (\$8,100) and one mile on the Nez Clearwater NF at \$3,600. Total: \$11,700.

R2a. New Drainage Feature – Drainage Dip: Along with storm proofing, new drainage dips are required to protect the road system from damage with increased post fire runoff. Four additional dips are requested on the Lolo NF at \$400 each (\$1,600). Three additional dips are requested on the Nez Clearwater NF at \$400 each (\$1,200). Total: \$2,800

R2. Storm Inspection and Response: There were multiple road sections on each forest that would need post-storm inspections and potentially a response if flooding and road damage occurs. There is an estimated need for 6 days of time on the Lolo NF for \$4,520 and 9 days of time on the Nez Clearwater NF for \$6,780. Total: \$11,300

R3. Culvert Removal: There are 12 plastic culverts on a drivable administrative road that burned in the fire. These are all on the Lolo NF (43110 road). The forest is requesting funds to remove these culverts and alleviate the safety hazard from collapsing road fill. Nine major culverts at \$2,800 each for \$25,200 and three minor culverts at \$1,500 each for \$4,500. Total: \$29,700

R11. Stream Crossing Protection (other): One culvert on the 595 road of the Nez Clearwater NF was found to be at risk of failing from increased runoff. The forest is requesting \$1,400 to protect this culvert and road fill from failing.

### **Protection/Safety Treatments:**

S1a. Road Hazard Signs: Road signs are requested to warn the public about post-risks and maintain public safety. Two signs at \$800 each for \$1600 total

**I. Monitoring Narrative:** No monitoring is proposed.

**PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS**

## Lolo National Forest

Line Items	Units	Unit Cost	# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	Total \$
<b>A. Land Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>B. Channel Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>C. Road and Trails</b>										
R1. Storm Proofing	miles	2,025	4	\$8,100	\$0		\$0		\$0	\$8,100
R2a. New Drainage Feature - Drainage	each	400	4	\$1,600	\$0		\$0		\$0	\$1,600
R2. Storm Inspection and Response	days	753	6	\$4,520						\$4,520
R3. Culvert Removal - Major	each	2,800	9	\$25,200						\$25,200
R3. Culvert Removal - minor	each	1,500	3	\$4,500						\$4,500
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road and Trails</i>				\$43,920	\$0		\$0		\$0	\$43,920
<b>D. Protection/Safety</b>										
S1a. Road Hazard Signs	each	1	800	\$800	\$0		\$0		\$0	\$800
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				\$800	\$0		\$0		\$0	\$800
<b>E. BAER Evaluation</b>										
Initial Assessment	Report			---	\$12,030		\$0		\$0	
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				\$0	\$12,030		\$0		\$0	\$0
<b>F. Monitoring</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$0	\$0		\$0		\$0	\$0
<b>G. Totals</b>				\$44,720	\$12,030		\$0		\$0	\$44,720

## Nez Perce-Clearwater National Forests



Line Items	Units	Unit Cost	# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	Total \$
<b>A. Land Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>B. Channel Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>C. Road and Trails</b>										
R1. Storm Proofing	miles	3,600	1	\$3,600	\$0		\$0		\$0	\$3,600
R2a. New Drainage Feature	each	400	3	\$1,200	\$0		\$0		\$0	\$1,200
R2. Storm Inspection and Repair	days	753	9	\$6,780						\$6,780
R11. Stream Crossing Protection	each	1,400	1	\$1,400						\$1,400
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road and Trails</i>				\$12,980	\$0		\$0		\$0	\$12,980
<b>D. Protection/Safety</b>										
S1a. Road Hazard Signs	each	1	800	\$800	\$0		\$0		\$0	\$800
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				\$800	\$0		\$0		\$0	\$800
<b>E. BAER Evaluation</b>										
Initial Assessment	Report			---	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				\$0	\$0		\$0		\$0	\$0
<b>F. Monitoring</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$0	\$0		\$0		\$0	\$0
<b>G. Totals</b>				\$13,780	\$0		\$0		\$0	\$13,780

**PART VII - APPROVALS**

1. \_\_\_\_\_  
 Forest Supervisor Date

