

**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: Bernard Peak****B. Fire Number: ID-IPF-000533****C. State: Idaho****D. County: Kootenai and Bonner****E. Region: 1****F. Forest: Idaho Panhandle National Forest****G. District: Sandpoint Ranger District****H. Fire Incident Job Code: P1NKL4 (0104)****I. Date Fire Started: 9/7/2020****J. Date Fire Contained: 10/17/2020****K. Suppression Cost: \$4,314,300.00****L. Fire Suppression Damages Repaired with Suppression Funds (estimates): \$50,000**

1. Fireline repaired (miles): 1.75-2.25
2. Road graded: 12-15 miles

**M. Watershed Numbers:***Table 1: Acres Burned by Watershed (HUC12)*

Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
Lake Pend Oreille	176,870	1,064	1%
Gold Creek	13,995	465	3%

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

OWNERSHIP	ACRES
NFS	1530
OTHER FEDERAL (LIST AGENCY AND ACRES)	0
STATE	0

OWNERSHIP	ACRES
PRIVATE	0
TOTAL	1530

- O. Vegetation Types:** The Bernard fire burned in 2,500-5,000 ft of elevation in a mixed conifer stand including western redcedar, Douglas fir, grand fir and western hemlock. Understory was comprised predominately of shrubs like ninebark.
- P. Dominant Soils:** Surface soils are derived from volcanic ash from Mount Mazama that erupted about 7,700 years ago, this ash cap exists at varying depths and with varying coarse fragment content which was largely related to slope. Soils within the fire perimeter are largely in hydrologic soil group B meaning that soils are deep to moderately deep and have moderate infiltration when thoroughly wet. Having formed in a forested environment in a frigid temperature regime and udic moisture regime, forest floor is derived of conifer needles and fine to coarse wood that ranges from 2 to 7 centimeters.
- Q. Geologic Types:** Volcanic ash cap originating from Mount Mazama overlies a mix of metasedimentary rocks and coarse-grained felsic intrusive rocks.

**R. Miles of Stream Channels by Order or Class:**

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	0
INTERMITTENT	0.59
EPHEMERAL	0
OTHER (DEFINE)	0

**S. Transportation System:**

**Trails:** National Forest (miles): about 3      Other (miles): 0  
**Roads:** National Forest (miles): 3.18      Other (miles): 0

### **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	220	0	0	0	220	14
Low	998	0	0	0	998	65
Moderate	287	0	0	0	287	19
High	8	0	0	0	8	1
No Data	27	0	0	0	27	2
Total	1530	0	0	0	1530	100

- B. Water-Repellent Soil (acres):** Hydrophobicity within the fire perimeter is highly variable. Within the small dataset of field observations collected during soil burn severity mapping, hydrophobicity did not correlate with soil burn severity class, nor was the presence of hydrophobicity consistent within any one soil burn severity class. The dataset collected during field work focused mainly on differentiating between burn severity boundaries (particularly high and moderate) within a fire that was primarily low burn severity. It is not realistically rigorous enough to draw conclusions about the specific presence of hydrophobicity across the fire. The following numbers are provided as a rough estimate only, to get a better understanding of the conditions that may be present on the ground.

<b>Degree of hydrophobicity</b>	<b>Acres</b>	<b>Percent of fire</b>
<i>Not present</i>	246	16%
<i>Low</i>	887	58%
<i>Moderate</i>	287	19%
<i>High</i>	110	7%

- C. **Soil Erosion Hazard Rating:** Potential soil erosion rates for individual soil types are dependent on characteristics such as slope, depth to bedrock and soil texture, which contribute to runoff potential. This is characterized as the soil erosion hazard rating. All soils within the fire perimeter have a moderately low runoff potential due to depth and presence of silt loam textures. However, steep slopes and rock fragment content contribute to an erosion hazard rating of severe for all soils within the burn area.
- D. **Erosion Potential:** South-facing aspects feeding into single channels had the lowest potential erosion rates, both pre and post-burn. A small drainage network near the southwest corner of the fire perimeter reported a 2.35 t/ac annual potential post-burn erosion rate. The erosion tolerance for most soil map units in the area is 3 to 4 t/ac. However, one unit, which occurs in select areas across the south aspect of the fire perimeter, has a tolerance rating of 2 t/ac. The entire steep north aspect has a tolerance value of 5t/ac, well above the modeled rates for this aspect, which do not go above 2.25 t/ac. It should be noted that high and moderate severity burn acres were not well represented when running this model. This is likely due to the size of the fire, and the relatively small acreage of high and moderate severity burn that the model had difficulty recognizing. Therefore, particularly steep slopes that experienced higher burn severity may in fact have higher potential post-fire erosion rates than the values that were modeled.
- E. **Sediment Potential:** Results of ERMiT modeling displaying average predicted sedimentation rates for each burn severity (low, moderate and high) in the first 3 years post-fire are presented in Table 2. There are 14 individual soil survey map units within the fire perimeter; however, one unit consists entirely of rock outcrop and was therefore not included in the modeling. The remaining 13 units were modeled for both low and moderate burn severity. Only 5 units were modeled for high burn severity. As a baseline, the model was also run for unburned with results showing less than 0.01 t/ac sediment delivery. Given this information, even low burn severity will potentially result in a significant increase in sediment delivery over the first 3 years after the fire.

<b>Burn Severity</b>	<b>1 year avg (ton/ac)</b>	<b>2 year avg (ton/acre)</b>	<b>3 year avg (ton/acre)</b>
<i>Low</i>	33.41	26.72	21.37
<i>Moderate</i>	39.18	28.32	21.37
<i>High</i>	54.45	43.38	32.7

It should be noted that ERMiT is a model that estimates sediment delivery on single hillslopes. Sediment delivery will be largely affected by the connectivity of moderate and high burn severity patches to the pour point, and with an estimated 1% high and 19% moderate soil burn severity within the fire perimeter this connectivity largely does not exist. Therefore, sediment delivery is not expected to reach the values estimated for high soil burn severity.

F. **Estimated Vegetative Recovery Period (years):** Given the size of the fire and the relatively low percentage of moderate and high soil burn severities, it is not expected that there has been significant damage to the seed bank. The fire burned in a mosaic pattern, with moderate and high severities interspersed between primarily low soil burn severity, and to a lesser extent, unburned soil. While some revegetation is expected within a single growing season, widespread vegetative recovery to establish consistent ground cover is expected to occur 3-5 years post fire. Natural recovery of tree species will take longer.

G. **Estimated Hydrologic Response (brief description):** The fire will have varying effects to hydrologic response based on the burn intensity and soil burn severity. The consumption of above-ground vegetation and the elimination of tree canopy in places will reduce precipitation interception. Areas of moderate and high soil

burn severity are accompanied by degraded soil structure, loss of forest floor and hydrophobic layers, which reduces infiltration and increases runoff.

Fire behavior created varying conditions within the burn perimeter. Burning within the sub-catchment above an unnamed tributary to West God Creek resided primarily along the ground, with moderate to high soil burn severities. The canopy of western cedar in this subcatchment was damaged but not consumed. While increased runoff and erosion are possible, needle cast from the damaged cedar canopy is already beginning to provide consistent forest floor cover to mitigate these effects. The steep, rocky slopes contributing to Lake Pend Oreille exhibited different burn patterns, with increased fire activity above ground that consumed most of the canopy in places and was accompanied by moderate to high burn severities. These slopes would exhibit elevated rates of erosion, as well as increased potential for the mobilization of debris downslope. Any elevated hydrologic response post-fire would subside over time as slopes revegetated and is expected to return to pre-fire conditions in 3-5 years.

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

### **Introduction/Background**

The Bernard fire had initiated on September 7, 2020 at the bottom of a mountain slope in Echo Bay. Strong northerly winds drive the fire upslope to Bernard Peak, and which point the winds calmed corresponding with a reduction in fire behavior. The fire burned in a mosaic pattern, with relatively low instances of high soil burn severity located in the upper third of the lake-facing slope, and surrounding by swathes of moderate soil burn severity along the ridgeline and low burn severity located further downslope.

### **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):** Human Life and Safety concerns have been identified within two popular recreation areas within the burned perimeter.
  - a. The first is along FS Trail 37 (Bernard Peak Trail), in which approximately 2 miles of the 5.2 mile trail has been burned. This presents a threat to HLS in the form of fire weakened trees that have the potential to fall on recreationists, and critically or fatally injuring someone. This is deemed to have very high risk due to a likely probability of damage or loss, with a major magnitude of consequences. **It is recommended that this trail remained closed until the snags can be addressed or fall naturally on their own, and until then signage be posted informing visitors of the closure and potential hazards.**
  - b. The second being a dispersed recreation site on a beach off of Lake Pend Oreille, below the Bernard overlook, that is typically reached by boat. This dispersed camp site is located below an oversteepened (>65%) slope that has burned, resulting in fire weakened trees, consumption of aboveground vegetation and damage to root systems. Under these conditions it is likely for debris to fall off the hillslope and into the dispersed camping area, which may critically or fatally injure a visitor resulting in a very high risk assessment. **It is recommended that this campsite remained closed, with signage posted informing visitors of the closure and hazard of falling debris.**
2. **Property (P):** Trail 37- approximately 3 miles of the trail are affected by the burn, 2 miles of which are affected by moderate to high soil burn severity. The trail prism is damaged in places due to roots and other organic matter within the tread that were consumed and is at risk for damage post-fire due to erosion and sedimentation. The probability of damage or loss was deemed to be likely with a

moderate magnitude of consequences, making the risk assessment for this value high. Due to the high risk, **trail work including out-sloping, cleaning trail structures, and installing new drain structures will be recommended for treatment.**

- b. Road 2707- This is the primary piece of road infrastructure within the Bernard burn perimeter, running along the upper third of the slope. There is only one water crossing for this road within the burned perimeter, with mixed severity burn above slope. The culvert, though undersized, was deemed to be in good condition and functioning appropriately. The likelihood for a low probability storm to initiate debris to damage the culvert is possible, but as water has low potential for diversion it is expected that if that storm were to occur water would overtop the road and flow right back into the stream channel on the other side making for moderate consequence of damage. The risk assessment for this road was deemed to be intermediate, and **treatment will not be recommended.**
3. **Natural Resources (NR):**Soil productivity and hydrologic function- Soil loss is expected primarily in areas of moderate and high soil burn severity (about 20% of the fire), however the loss is localized to specific steep areas and is expected to remain within the tolerance for soil loss in these sites. This results in a low risk to soil productivity due to soil loss. As these sites are within fire-dependent western forest, any sediment that will be delivered to streams is determined to be within the natural realm of variation during the reoccurrence of fire on the landscape. Risk associated with hydrologic function is also low, and therefore **no hillslope treatments will be recommended.**
- b. Bull trout critical habitat in Gold Creek- This critical value was considered in this assessment as the fire burned upslope of Gold Creek. The contributing area to Gold Creek is comprised of mostly unburned and low soil burn severities, with some patches of moderate, and the fire left a buffer of unburned vegetation along the stream. Sedimentation into the creek was deemed to be possible but is not expected to occur in volumes that would damage TES habitat. With a risk assessment of low, **no treatment is recommended.**
  - c. Non-native invasive species (NNIS) spread- NNIS spread was considered in this assessment, as NNIS are already present within and adjacent to portions of the fire. Widespread NNIS can result in loss of native vegetation cover and diversity, as well as reduction in habitat for wildlife and pollinators that depend upon native plant communities. Further, NNIS can lead to reduced overall plant cover, which can lead to loss of soil productivity and increased potential for surface erosion. Fires, particularly where soil burn severity is moderate to high, can result in NNIS expansion because those areas often have little to no native plant cover and native seed banks are often destroyed. The likelihood of NNIS spread is further exacerbated where moderate-high burn severity areas are adjacent to existing NNIS populations or road/trail corridors which could serve as vector conduits (by weed seed movement associated with human activities) into those conducive site conditions where NNIS can spread without competition from native plants. NNIS spread/expansion as a result of the Bernard Fire is “likely” to “very likely”, with a “moderate” consequence, resulting in a “high” to “very high” risk factor. By monitoring for NNIS spread and then treating new/expanding NNIS populations, the likelihood of NNIS establishment/spread can be reduced. In particular, **monitoring for and treating “new invader” weed species, is a form of “Early Detection/ Rapid Response”, which is widely accepted as the most effective mitigation for effects of NNIS.**
4. **Cultural and Heritage Resources:**The ridgeline extending from the Bernard Overlook carries significant spiritual significance to the local Tribes, and is eligible for the National Register of Historic Places. The removal of vegetation due to the fire has created a lot of open access to this ridgeline, and an increased potential for unauthorized Off-Highway Vehicle traffic (OHV). The probability of damage or loss to the ridgeline is likely, with a moderate magnitude of consequence making for a high risk to this BAER critical value. **Treatments recommended are the creation of barriers to the ridgeline by felling snags to prevent OHV usage.**

## B. Emergency Treatment Objectives:

Objectives of the Bernard BAER treatment recommendations are to minimize the threats to human life and safety to the extent possible by applying administrative closures and posting signage. Illegal OHV traffic on the culturally significant ridgeline accessed from the Bernard overlook will be discouraged by creating physical

barriers using snags on site. Spread of invasive, non-native plant species will be minimized through Early Detection Rapid Response efforts, where emergent invasive populations are treated as necessary through methods approved by the Sandpoint Ranger District Weeds EIS.

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

Land: 50

Channel: NA

Roads/Trails: 75

Protection/Safety: 90

**D. Probability of Treatment Success**

Table 6: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
<b>Land</b>	50	60	70
<b>Channel</b>	NA	NA	NA
<b>Roads/Trails</b>	75	80	85
<b>Protection/Safety</b>	85	90	95

**E. Cost of No-Action (Including Loss):** Any cost to human life is unacceptable, the cost of no-action for the treatments identified to address human life and safety concerns are invaluable. The cost of damage to an identified sacred site would also be invaluable. If EDRR treatments were not implemented post fire to identify and treat emergent invasives in the post fire environment, invasive may establish and spread. Additional costs would be incurred by the Forest Service to treat these areas after species establishment and spread. This increased cost of no-action is estimated at about 2.5 times the estimated cost of BAER treatment, which is \$21,688. A similar estimate for cost of no-action may be taken for trails infrastructure. Failure to complete timely trail work as proposed may result in sedimentation on trail and improper drainage may exacerbate damage to trail over time. In applying the same 2.5 coefficient, one might expect the cost of no-treatment to trails in being \$24,120. Total cost of no action being (\$21,688+\$24,120) **\$45,808**.

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

- Early detection rapid response (EDRR) invasives treatment- \$8,675
- Improved trail drainage- \$9,500
- Trail signage- \$ 474.00
- Bernard ridgeline barrier- \$2,400
- **Total- \$21,197**

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

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

**Team Leader:** Jori Johnson

**Email:** jori.a.johnson@usda.gov

**Phone(s):** (208)-765-7295

**Forest BAER Coordinator:** Jori Johnson

**Email:** jori.a.johnson@usda.gov

**Phone(s):** (208)765-7295

**Team Members:** Table 7: BAER Team Members by Skill

Skill	Team Member Name
<b>Team Lead(s)</b>	Jori Johnson
<b>Soils</b>	Maureen Yonovitz
<b>Hydrology</b>	Chris Robinson
<b>Engineering</b>	Joe Heisel

Skill	Team Member Name
Archaeology	Carmelita Angeles
Weeds	Jennifer Costich-Thompson
Recreation	Lisa Portune

## H. Treatment Narrative:

### Land Treatments:

Early detection rapid response (EDRR) treatments are intended to identify and treat emerging invasive species within the first year after the fire. There is a possibility that follow up treatments are needed beyond the first year after the fire, but those will need to be addressed on-forest and outside of the BAER program. Locations identified for EDRR may include multiple weed species which may require treatment at different times and/or with different herbicides. Any weeds treatments needed will be completed within the scope of treatments approved by the Sandpoint Ranger District Weeds EIS and coordinated with the North Zone Weeds Coordinator. Based upon site conditions, we anticipate approximately fifteen acres of roadside herbicide application will be needed. Additionally, up to ten acres of off-road herbicide application may be necessary to treat new/expanding new invader weed species in the burned area (which requires higher contract rates for backpack herbicide application). Associated with those herbicide treatments to treat NNIS, we anticipate the need for up to five days of pre- and post-treatment (efficacy) monitoring by district personnel.

In order to prevent the illegal traffic of off-highway vehicle use on the Bernard Ridgeline, natural materials on site (snags) will be utilized to provide a physical barrier to motorized vehicles. This ridgeline is sacred to local tribes and as such is eligible for the National Register of Historic Places. The consumption of vegetation has created exposed ground on which OHV's may operate off trail, the felling of snags on site is intended to prevent illegal OHV usage in the short term until the area revegetates.

Treatment estimates include cost per day for (2) two person GS5 saw teams at \$800/day.

Treatment	Units	Unit Cost	# of Units	Total Cost
<i>Invasives EDRR (roadside)</i>	Acres	\$200	15	\$3,000
<i>Invasives EDRR (off-road)</i>	Acres	\$500	10	\$5,000
<i>Invasives pre-/post-treatment monitoring</i>	Days	\$135	5	\$675
<i>Bernard Ridgeline barrier</i>	Trip/day	\$800	3	\$2,400

### Channel Treatments: NA

### Roads and Trail Treatments:

To address damage to trail 37, several maintenance actions are proposed to address drainage concerns that would lead to both erosion from and sedimentation to the trail prism in the post-fire environment. Establishing proper trail drainage would ensure conditions that exacerbate trail damage do not continue. Sediment that is mobilized in the post fire environment can fill existing drainage features and channel water flow over the trail, damaging the prism. Improperly functioning trail drainage may build sediment and debris above the trail to the extent that a high volume precipitation event triggers instability and removes the trail prism via mass erosion.

Trails	Units	Unit Cost	# of Units	BAER Funding
<i>Outsloping (Mod Severity)</i>	mile	\$500	0.8	\$400
<i>Clean Trail Drain Structures</i>	each	\$20	40	\$800
<i>Replace/Install Drain Structures</i>	each	\$80	30	\$2400

*Outsloping (Mod/High Severity)*  
*Replace Damaged Culverts*  
*Hazard Tree Removal*  
*Subtotal*

mile	\$1200	2.0	\$2400
each	\$350	2	\$700
mile	\$1000	2.8	\$2800
			\$9500

**Protection/Safety Treatments:** Signs warning of fire-related hazards exist on the 2707 road, and are deemed sufficient to address life and safety concerns along that road at this time. However, signage is recommended to be posted in several strategic areas for Trail 37 to inform the public as to its closure and the post-fire hazard due to snags.

<b>Treatment</b>	<b>Units</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Total Cost</b>
<i>Trail signage</i>	Each	158	3	474



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

			NFS Lands			Other Lands			
		Unit	# of		Other	# of	Fed	# of	Non Fed
Line Items	Units	Cost	Units	BAER \$	\$	units	\$	Units	\$
<b>A. Land Treatments</b>									
Invasives EDRR (roadside)	Acres	200	15	\$3,000	\$0		\$0		\$0
Invasives EDRR (off-road)	Acres	500	10	\$5,000					
Invasives pre-/post-treatment monitoring	Days	135	5	\$675					
Natural ridgeline barrier	trip/day	800	3	\$2,400	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Land Treatments</i>				\$11,075	\$0		\$0		\$0
<b>B. Channel Treatments</b>									
none				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0
<b>C. Road and Trails</b>									
Outsloping (Mod Severity)	mile	500	0.8	\$400	\$0		\$0		\$0
Clean Trail Drain Structures	each	20	40.0	\$800					
Replace/Install Drain Structures	each	80	30.0	\$2,400					
Outsloping (Mod/High Severity)	mile	1,200	2.0	\$2,400					
Replace Damaged Culverts	each	350	2.0	\$700					
Hazard Tree Removal	mile	1,000	2.8	\$2,800					
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Road and Trails</i>				\$9,500	\$0		\$0		\$0
<b>D. Protection/Safety</b>									
Trail signage	each	158	3	\$474	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Protection/Safety</i>				\$474	\$0		\$0		\$0
<b>E. BAER Evaluation</b>									
Initial Assessment	Report			\$6,776	\$0		\$0		\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0
<i>Subtotal Evaluation</i>				\$6,776	\$0		\$0		\$0
<b>F. Monitoring</b>									
None				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Monitoring</i>				\$0	\$0		\$0		\$0
<b>G. Totals</b>									
Previously approved				\$21,049	\$0		\$0		\$0
Total for this request				\$21,049					

**PART VII - APPROVALS**

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