Date of Report: 10/24/2022

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: Kootenai River Complex

B. Fire Number: ID-IPF-000653

C. State: Idaho

D. County: Boundary

E. Region: Northern Region (R1)

F. Forest: Idaho Panhandle National Forest

G. District: Bonners Ferry Ranger District

H. Fire Incident Job Code: (0104) P2P1LC

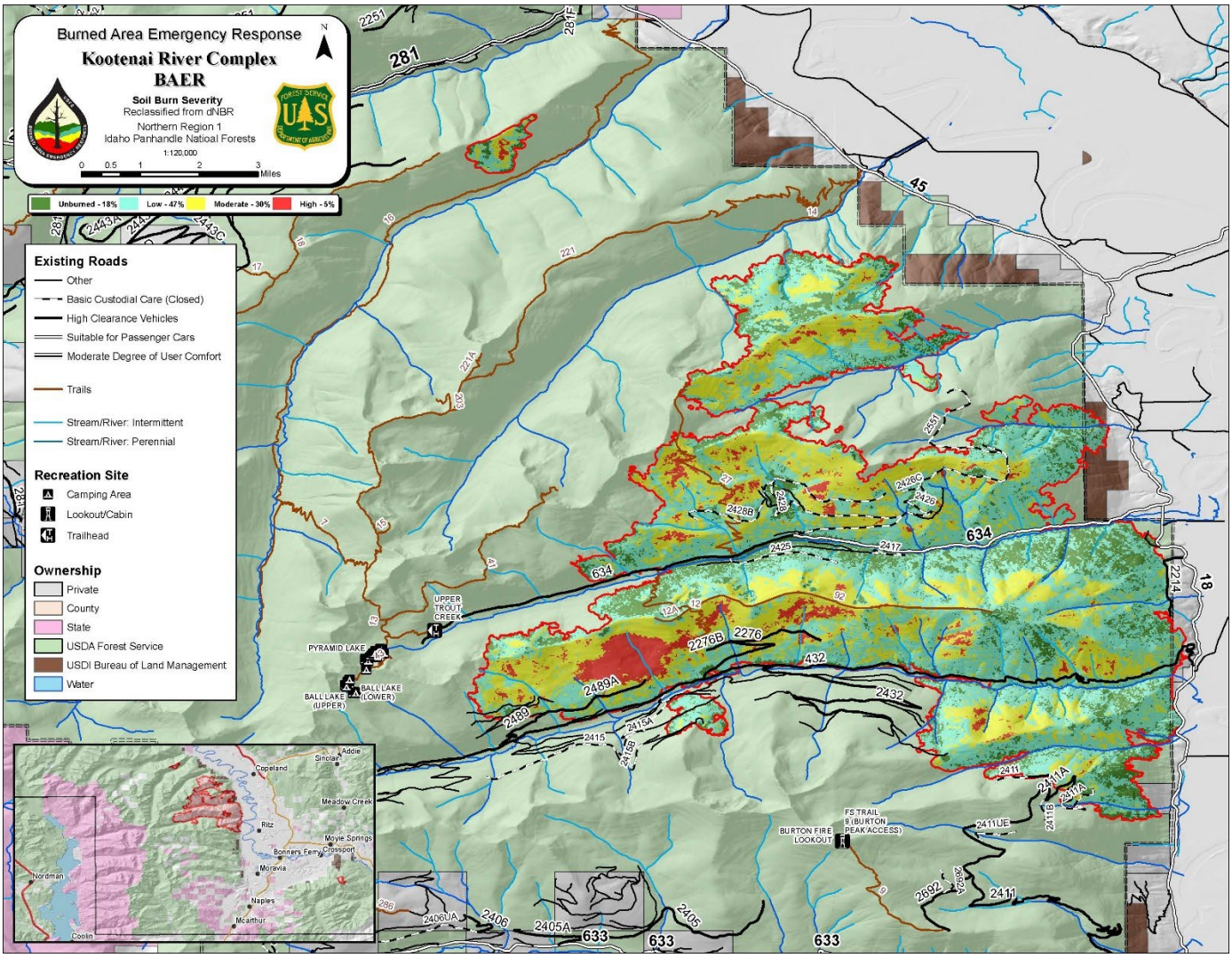
I. Date Fire Started: August 13, 2022

J. Date Fire Contained: TBD

K. Suppression Cost: $14,530,248 as of 10/12/2022

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

1. **Fireline repaired (miles): 0 miles as of 10/12/2022**
2. **Other (identify):**



M. Watershed Numbers:

Table 1: Acres Burned by Watershed. Perimeter used for analysis is the same as the date the post-fire image was taken for the BARC, October 1, 2022.

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170101040710	Long Canyon Creek	19,281	224	1.2%
170101040709	Parker Creek	10,523	993	9.4%
170101040704	Burton Creek-Kootenai River	16,079	1,661	10.3%
170101040503	Lower Smith Creek	9,675	7	0.1%
170101040708	Brush Creek-Kootenai River	25,092	3,009	12.0%
170101040302	Dobson Creek-Kootenai River	16,409	233	1.4%
170101040301	Sand Creek-Kootenai River	15,932	65	0.4%
170101040703	Ball Creek	17,171	6,989	40.7%
170101040102	Lower Boulder Creek	18,276	54	0.3%
170101040711	Hall Creek-Kootenai River	33,287	310	0.9%
170101040706	Rock Creek-Kootenai River	18,876	1404	7.4%
170101040705	Trout Creek	12,444	8,260	66.4%

N. Total Acres Burned: 23,177 (as of 10/1/2022)

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	22,996
BLM	84
STATE	0
PRIVATE	97
TOTAL	23,177

***NOTE:** Variations in geoprocessing tools and approaches may result in slightly different acreage totals among this report.

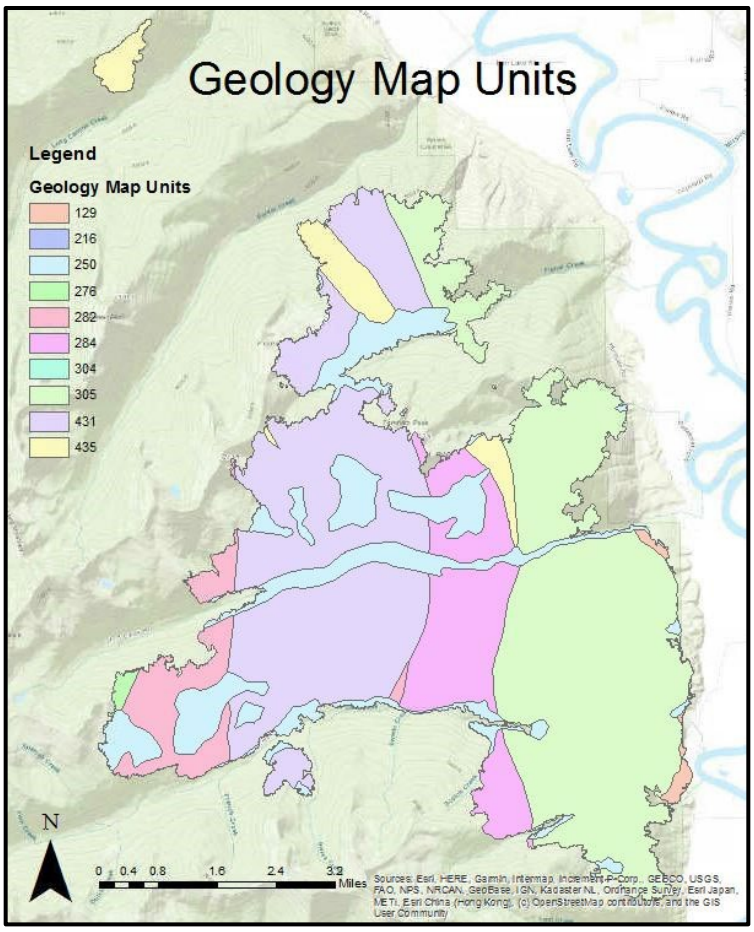
Vegetation Types:
Undisturbed vegetation in the burn area consisted of three main forest types. Mixed subalpine, mixed coniferous forest, and dry open, mixed coniferous forest types. Mixed subalpine and mixed coniferous forests are characterized by elevation. Mixed subalpine forests are comprised of subalpine fire, Engelmann Spruce and lodgepole pine with menziesia and beargrass as a dominant understory component. Transitions into mixed conifer forest types see western hemplock, western redcedar, douglas fir lodgepole pine, and grand fir. Dry open mixed coniferous forests are predominantly present on southern and heavily scoured aspects and are less pervasive within the burn area. Dry, open, mixed coniferous forest dominated by Douglas-fir and ponderosa pine, and a robust understory of shrubs, forbs and grasses. Presence of shallow, rocky soils, talus and rock outcrop on a dry aspect are present, particularly in the steep areas to the east of the fire perimeter.

Whitebark pine is proposed to be federally listed species under the Endangered Species Act. Whitebark pine habitat is present in the burn perimeter, and included two Plus trees. These plus trees are selected for desirable genetic traits that are used to grow blister rust resilient saplings for restoration throughout the northern region.

Dominant Soils: Soils data was downloaded from NRCS Web Soil Survey and derived from the Boundary County and Idaho Panhandle National Forest Soil Survey Areas. Soils within the burn area are predominately Volcanic Ash cap influenced with varying degrees of ash cap thickness, coarse fragment content, and mixing. Such surface horizons range from sandy loam to silt loam. Subsoils are typically formed in glaciated granitics parent materials which consist of glacial till and colluvium derived from granitic bedrocks. To a much lesser extent, some subsoils within the burn area are formed in glacial lacustrine deposits. Soil productivity in the burn area is primarily a function of ash cap thickness, coarse fragment content, soil depth, and slope aspect.

A. Geologic Types:

Map Unit	Description	Minor Unit	Acres	Percent of Area
129	glacial-lacustrine deposits	Lake deposits	130	1
216	Pritchard Formation, Ravalli Group	Siltite-argillite	308	1
250	glacial and alluvial deposits	Stream deposits	3,163	14
276	Monzogranite of Klootch Mountain, Priest River Complex	Felsic intrusive rocks	76	0
282	mixed two-mica rocks of Ball Creek, Priest River Complex	Felsic intrusive rocks	1,188	5
284	Tonalite of Snow Peak, Priest River Complex	Felsic intrusive rocks	2,443	11
304	mafic intrusive rocks, Ravalli Group	Mafic intrusive rocks	43	0
305	Pritchard Formation, metamorphosed, Ravalli Group	Schist-gneiss	8,304	36
431	Monzogranite of Hunt Creek	Felsic intrusive rocks	6,622	29
435	Monzonite of Long Canyon	Felsic intrusive rocks	932	4
Total			23,209	100



B. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	28
INTERMITTENT	23
EPHEMERAL	0
OTHER (DEFINE)	

C. **Transportation System:**
Trails: *National Forest (miles):* 11.9 *Other (miles):* 0
Roads: *National Forest (miles):* 41.6 *Other (miles):* 0.3

PART III - WATERSHED CONDITION

A. Soil Burn Severity (acres):

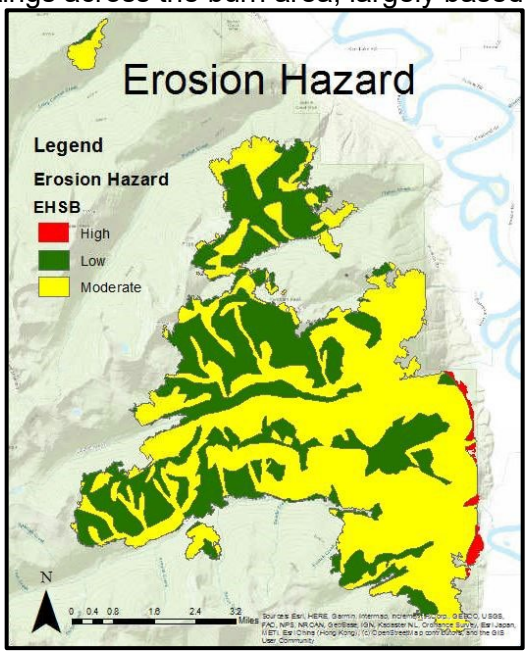
Table 4: Soil Burn Severity Acres by Ownership

Soil Burn Severity	NFS	BLM	State	Private	Total	% within the Fire Perimeter
Unburned	4,139	20		47	4,206	18
Low	10,859	63		80	11,002	47
Moderate	6,933	1		7	6,941	30
High	1,068	0		0	1,068	5
Total	22,999	84		134	23,217	100

B. Water-Repellent Soil (acres): Hydrophobicity was measured using the water-drop method and various depths for each observation point. Field observations were limited to directly off of road systems due to hazardous field hiking conditions. Background hydrophobicity in the area is pervasive due the volcanic ash influence which affects most land types across the burned area. As such, whether due to background water repellency or a result of the burn's influence, strong hydrophobicity was present at each observation point. Due to these observations, the soils specialist is assuming that all fire affected areas within the burn area exhibit strong hydrophobicity at the mineral soil surface.

A. Soil Erosion Hazard Rating: Erosion Hazard rating were derived from the IPNF land systems inventory (LSI). Attributes selected to characterize inherent erosion hazard was subsoil erosion hazard, which best describes soil erosion response in the absence of typical ground cover such as vegetation or forest floor. Inherent erosion hazard shows primarily low and moderate ratings across the burn area, largely based on site slope. Land systems inventory data is only present on National Forest System lands, so slight discrepancies in total acres may be present.

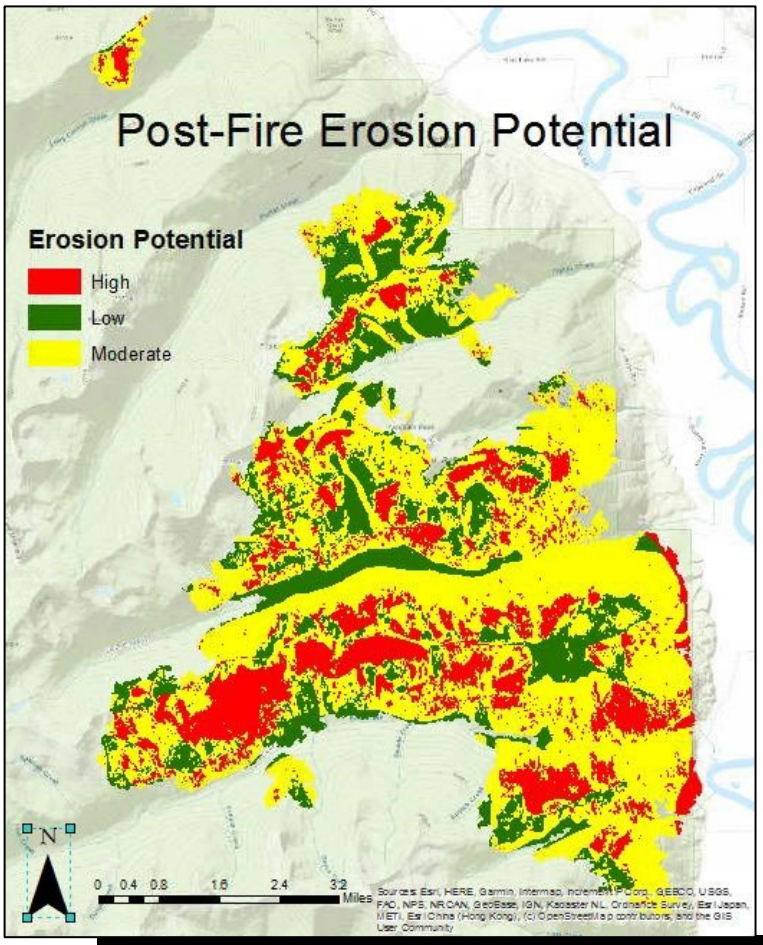
Erosion Hazard		
Rating	**Acres**	**Percent**
High	219	1
Low	8,588	37
Moderate	14,272	62
Total	23,079	100



B. Erosion Potential: Erosion Potential Included two separate analyses.

Post-fire erosion potential ratings are a product of the inherent erosion hazard modified by soil burn severity. In the post-fire environment, changes to hillslope erosion potential can be attributed primarily to changed condition as described by soil burn severity (SBS). Moderate and High SBS result in a loss of forest floor, majority of understory vegetation, and will impact soil structure and infiltration to varying degrees. The erosion potential map provides a visual for relative erosion hazard which would be compounded by moderate and high SBS.

Hillslope erosion potential was also modelled in WEPP PEP and is reported is lbs/ac/yr by watershed, for both undisturbed and post-fire conditions. It should be noted that modelling outputs are only as good as the input data. The soil burn severity map is a rapid assessment product that was constructed off of limited field observations due to limited access to the fire and overall safety concerns. Therefor model results should be used to identify areas with elevated erosion rates in the post fire environment to highlight areas of concern, and not used directly as a predictive tool. Ball Creek displayed the highest magnitude of modelled erosion potential change; however, erosion rates are still nominal within the watershed.



Post-Fire Erosion Potential Rating		
Erosion Potential	**Acres**	**Percent**
High	4,915	21
Low	4,731	20
Moderate	13,433	58
Total	23,079	100

Modelled Hillslope Erosion Potential by Watershed			
Watershed	**Undisturbed (lbs/ac/yr)**	**Post-Fire (lbs/ac/yr)**	**% Change post-fire**
Trout Creek	5	26	520%
Ball Creek	5	1212	24,240%

C. **Sediment Potential:** Sediment potential was determined using WEPP PEP. Undisturbed and post-fire runs were done on both major watersheds and reported as tons/year sediment discharge from pour points just downstream of the burn boundary. Sediment discharge includes sediments derived from both channel and hillslope erosion. Model results should be used to identify areas with elevated erosion rates in the post fire environment to highlight areas of concern, and not used directly as a predictive tool. The modelling shows elevated relative sediment potential in the Ball Creek watershed as compared to Trout Creek. The extent of moderate and high burn severity along Russell Ridge and along tributaries to Ball creek are expected to produce elevated sediment in this drainage until the area revegetates.

Modelled Sediment Potential by Watershed			
Watershed	**Undisturbed (tons/yr)**	**Post-Fire (tons/yr)**	**% Change post-fire**
Trout Creek	4900	5500	112%
Ball Creek	6600	16000	242%

F. Estimated Vegetative Recovery Period (years): Vegetative recovery periods are largely dependent on soil burn severity, as well the size and spatial distribution of patches of moderate and high soil burn severity. Areas with low soil burn severity maintain forest floor cover, as well as soil structure and live root mass. It is expected that these areas will recover relatively quickly (1-3 years). Vegetative recovery will be negatively effected in areas of moderate or high soil burn severity where the consumption of the forest flow may have also consumed the seed bank. In areas of expansive moderate and high soil burn severity, proximity to live plants will determine the ability of that site to repopulate with vegetation. If more severely burned areas are within about a quarter of a mile of live, reproducing native vegetation, revegetation may take longer but is expected to occur naturally (2-5 years). If mass sheet erosion were to occur, resulting in loss of topsoil, that site would lose many of the plant available nutrients that are concentrated generally in the top 6 inches of soil, and vegetative recovery would be severely inhibited.

G. Estimated Hydrologic Response (brief description): Removal of forest canopy through stand-consuming fires can increase water yield and modify hydrographs (i.e. increased peak flows). Fire affects hydrology through the removal of aboveground canopy, removal of litter, and occasionally by creating a water repellent (hydrophobic) soil layer. Subsequently, soil water storage, interception and evapotranspiration are reduced when vegetation is killed and organic material on the soil surface is consumed by fire. Normal patterns of snow accumulation and melt are likely also modified. The changes caused to these processes by the Kootenai River Complex Fire will likely cause increased peak flows and altered runoff timing and base flows. These potential changes would be most likely within the Ball and Trout Creek watersheds where 41% and 66% of the total watershed area, respectively, has been burned. All of the other fire-affected watersheds have less than 12% of the area burned, which would not produce measurable changes to water yield or other hydrologic processes and will not be discussed further in this report. Water yield typically increases significantly in the first year following fire then decreases with time as vegetation reoccupies a watershed (Peterson et al. 2009). However, many researchers have documented high variability in discerning relationships of the percent of watershed canopy removed and changes in peak flows and have concluded that at least 20 percent of the basal area must be removed before increases in water yield are detectable (Thomas and Megahan 1998, Grant et al. 2008).

Water quality in streams that drain the burned area will be impaired during runoff events, particularly in the peak flow season of May to June or during Rain-On-Snow (ROS) events which can occur mid-to-late winter during the months of December to early March. An initial flush of ash and fine sediment is expected during and following the first large rain events of the fall season or ROS events during the winter and spring. ROS events are low probability events that tend to occur infrequently correlating with 25 year or greater return interval storms.

Suspended sediment loading and turbidity levels in streams within and below the burned area will be elevated during runoff season until groundcover becomes re-established. Even after groundcover stabilizes burned area hillslopes, eroded fine sediment that is deposited in stream channels and floodplains in the next few years will continue to move through the system for many years to come.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Kootenai River Complex includes a series of fires that started separately during lightning storms that occurred in August 2022, all on the Bonners Ferry Ranger District of the Idaho Panhandle National Forest. The first fire that was detected, Eneas Peak, was confirmed on August 13th, followed by the Trout Fire, the Russell Mountain Fire, the Scotch Fire, and the Katka fire. All fires burned in the Selkirks Northwest of Bonners Ferry, except for the Katka Fire which is located in the Cabinet Mountain Range approximately 8 miles east of Bonners Ferry. On September 2, 2022, the Eneas Peak, Katka, Russell Mountain, Scotch Creek, and Trout Fires were officially grouped into the Kootenai River Complex. Fires burned in overly steep and rocky terrain, resulting in mostly indirect fire suppression tactics along the eastern flank. Direct fire suppression tactics were utilized occasionally in the form of aerial operations with water bucket drops.

By the time of the BAER assessment, the Eneas Peak, Russell Mountain, Scotch Creek and Trout fires had grown into one larger fire perimeter. While the Katka and Long Canyon Fires were managed as a part of the complex, the geographic isolation from the bulk of the fire, as well as the size of these fires were suspected to not be a priority of this BAER assessment. A helicopter flight on October 12th by the BAER team lead confirmed that an in-depth analysis of the Katka and Long Canyon fires were unnecessary due to the mixed severity of the fire, size, and lack of BAER critical values proximal to these fires.

The BAER assessment began on October 11, using a BARC image that utilized a post-fire image for the dNBR dating October 1, 2022. The fire was still active and flanking at the time of the BAER assessment, and access to field verify the affected trail systems were compromised due to personnel safety concerns from fire-weakened trees. An interim BAER assessment may be utilized after a more thorough field evaluation of trail infrastructure.

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**	**Very High**	**Low**
Likely	**Very High**	**High**	**Low**
Possible	**High**	**Intermediate**	**Low**
Unlikely	**Intermediate**	**Low**	**Very Low**

1. Human Life and Safety (HLS):

Value	Probability	Consequence	Risk Rating	Threat
Human Life and Safety on trails and roads	Possible	Major	High	Fire weakened trees (snags) are at risk of falling and causing serious harm or loss of life to forest employees and visitors.

2. Property (P):

Value	Probability	Consequence	Risk Rating	Threat
NFSR 432 and 634 (Open Roads)	Likely	Major	Very High	Road damage from elevated runoff and debris flow at stream crossings
NFSR 432 and 634 (Open roads)	Very likley	Moderate	Very High	Damage from sluffs and ravelling debris.
Ham creek roads 2426 and 2428	Likely	Minor	Low	Road damage from elevated runoff and debris flow at stream crossings. Damage from sluffs and ravelling debris.

English creek roads 2276 and 2276B	Likely	Moderate	High	Road damage from elevated runoff and debris flow at stream crossings. Damage from sluffs and ravelling debris
Forest Service trails: 12 (Russell Peak) and 27 (Fisher Peak)	Likely	Moderate	High	Burnt out root masses undermine the structural integrity of the trail. In areas of moderate to high burn severity, damage to trail prisms possible due to erosion, washouts, and/or debris flows.
Forest Service Trail 92 (Russel Ridge)	Possible	Low	Intermediate	Burnt out root masses undermine the structural integrity of the trail. In areas of moderate to high burn severity, damage to trail prisms possible due to erosion, washouts, and/or debris flows.

3. Natural Resources (NR):

Value	Probability	Consequence	Risk Rating	Threat
Native plant communities already moderately to highly impacted (high mortality) from the Kootenai River Complex, particularly those plant communities in lower elevation, dry site communities in the Ball Creek, Trout Creek, and Cascade Creek areas.	Likely	Moderate	High	Non-native Invasive Species (NNIS)- particularly "new" (not widespread) invasive species. Areas of moderate to high soil burn severity are highly susceptible to invasive species spread. Mechanical suppression lines were not utilized in most of the fire area due to steep terrain, therefore the primary risk of NNIS spread on NFS lands is along roads and some off-road dry sites in the lower elevations of Ball Creek, Trout Creek, and Cascade Creek drainages. NNIS spread due to suppression acitivities is low risk on NFS lands but the threat of NNIS spread onto private and other federal land (KWR and BLM) due to suppression activities is moderate.
Whitebark pine populations and habitat along ridges, saddles and high elevation southern aspects within the fire perimeter above 4,500'	Likely	Moderate	High	Mortality of existing populations or delayed mortality of mature, cone-producing whitebark pine trees resulting from crown/bole/root scorch-related stress and/or increased mountain pine beetle activity.

Whitebark pine plus trees	Likely	Moderate	High	Mortality of existing populations or delayed mortality of mature, cone-producing whitebark pine trees resulting from crown/bole/root scorch-related stress and/or increased mountain pine beetle activity.
Soil Productivity	Possible	Moderate	Low	Post-fire conditions can recude infiltration and increase overland flow, subsequently resulting in soil erosion and potentially mass soil loss from hillslopes. This fire resulted in a mosaic burn, with low connectivirty from high severity patches to stream delivery. Though most of the forest floor was consumed in the moderate burn, there is ample needlecast in areas to provide ground cover.
Hydrologic Function	Possible	Moderate	Intermediate	Fire affects hydrology through the removal of aboveground canopy, removal of litter, and occasionally by creating a water repellent (hydrophobic) soil layer. Subsequently, soil water storage, interception and evapotranspiration are reduced when vegetation is killed and organic material on the soil surface is consumed by fire
Water quality	Possible	Moderate	Intermediate	Suspended sediment loading and turbidity levels in streams within and below the burned area will be elevated during runoff season until groundcover becomes re-established.
Bull trout	Possible	Moderate	Intermediate	Bull trout and bull trout critical habitat in Trout Creek and Ball Creek may incur some level of negative impacts associated with post fire effects primarily due to sedimentation from hillside erosion, debris flows, and possibly road and culvert failures. Increased levels of fine sediment deposition in these streams may impact efficient feeding and the quantity and quality of pool habitat.

4. **Cultural and Heritage Resources:Emergency Treatment Objectives:**
   - Human life and safety on roads and trails in high and moderate severity burn areas by installing warning signs.
   - Reduce road damage from increased runoff and sediment by installing critical dips at crossings with a likely probability of damage. Stormproof other areas of road to facilitate proper drainage of water from prism. Limited storm inspection and response to be used as necessary to maintain road drainage after large precipitation events.

- Trails from increased runoff and sediment through cleaning drainage and install waterbars in high and moderate burn severity areas.
- Protect human life and safety from hazard trees at select locations where treatment implementation would put workers at risk (I.e. storm inspection and response and trail drainage installation).
- Reduce or prevent negative impacts to native plant communities and facilitate native plant recovery by reducing the spread invasive plants within the area, especially along and adjacent to Forest roads and in areas with localized invasive plant species within and adjacent moderate and high intensity burns the first year following containment of the fire.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: 90%
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*
Land	90	95	95
Channel	NA	NA	NA
Roads/Trails	75%	90%	90%
Protection/Safety	90%	95%	95%

E. Cost of No-Action (Including Loss): >$618,000
The estimated cost of rebuilding roads infrastructure given damage or loss is $518,000.
Assuming trail reconstruction costs of approximately $25,000 per mile, cost of reconstructing trails at risk would be $100,000.
Native and naturalized communities are a non-market value, however herbicide treatments implemented after non-native invasive species spread into newly disturbed areas would be a multiyear effort and would far exceed the cost of EDRR treatments.

F. Cost of Selected Alternative (Including Loss):
The cost of all proposed treatments $187,858.

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)**: 208-277-8790

Forest BAER Coordinator: Jori Johnson
Email: **Phone(s):**

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

Skill	**Team Member Name**
Team Lead(s)	Jori Johnson
Soils	Philip Schwartz
Hydrology	Brandon Glaza
Engineering	Brian Story

Skill	Team Member Name
GIS	Dustin Gates
Archaeology	
Weeds	Jennifer Costich-Thompson (also covering TES plants)
Recreation	Steve Petesch and Nate Demmons
Other	Sean Stash (Fisheries)

H. Treatment Narrative:

Land Treatments:
Early Detection and Rapid Response (EDRR) of Non-native Invasive Species: Reduce the potential for establishment of new noxious weed infestations in native or naturalized communities, particularly establishment of new noxious weed infestations in highly susceptible burned areas, prevent spread of existing infestations, and decrease rate of spread of weed density from existing infestations. Treatments will focus in areas with a high likelihood of new infestations due to moderate to high soil burn severity along common weed vectors (roads). This fire did not utilize mechanical fire line or establish other disturbed sites (like drop points) due to the steep ground, so this request will not include an EDRR Suppression request.

Location- Suitable Sites: Roadside treatments along NFSR432 and 634, small portions of the NFSR2411, and potentially small off-road areas in lower elevations of Ball and Trout Creek drainages where invasive annual grasses were observed.
Specifications:

- Forest service would prepare and act as a contracting officer's representative (COR) on the Invasives EDRR contract.
- Contractors would survey along designated roadsides (see treatment map) for presence of new non-native invaders at that would perceivably re-establish faster than native species in the moderate and high burn severity areas.
- Invasive species would be treated with NEPA approved herbicides according to IPNF design features and chemical label instructions.

Channel Treatments: NA

Roads and Trail Treatments:
Stormproofing and Select Hazard Tree Removal: The watersheds burned in the Kootenai River Complex Fire will show the effects of the fire via increased runoff rates, erosion, sediment, and debris transport creating a future concern for roads and associated drainage structures. The effects could result in filling the ditches, plugging culverts and potentially overtopped or washed away road surfaces and fill slopes. Water bars and rolling dips can become filled with material until they are no longer functioning properly. Removing the material from these structures will allow them to continue to move water across the road instead of allowing it to overtop the structure and potential run down them. Treatments are recommended to minimize the risks to public safety and protect the investment of the transportation system from the expected increased post-fire runoff.
Location (Suitable) Sites:
Road drainage locations:

NFSR #	NAME	MILES	TREATMENT
634	Trout Creek	5.1	Cleaning existing drainage features
432	Ball Creek	6.3	Cleaning existing drainage features
2276	English Creek	1.1	Cleaning existing drainage features to the junction with Russel Peak trailhead.
	Total	**12.5**	

Design/Construction Specifications:

- Ditch Cleaning – Where present, drain ditches along the length of the roads shall have all existing silt and debris removed and either hauled away or side cast such that the material cannot reenter the drainage structure during a runoff event.
- Culvert Cleaning – Remove any blockages from inlet, outlet and inside barrel and straighten bent inlets and outlets when possible. Catchment-basins shall have all existing silt and debris removed from in front of the culvert inlet so that they are functioning at full capacity. Culverts are typically 18 inches to 24-inch ditch relief culverts.
- Water Bar and Rolling Dip Re-establishment and cleaning – remove the material that has accumulated in the water bars and rolling dips. This is most effectively done while grading the road.
- Hazard Tree mitigation – Hazard trees will be felled that are within reach of all sites where drainage work will be needed. Hazard tree felling will occur only to ensure safety of workers implementing BAER treatments, not to make the road safe for public traffic.
    - Place trees on contour (where possible) in locations that do not adversely affect road drainage.
    - Review hazards of felling trees/JHA before implementation.

Installation of Critical Dips

Purpose of Treatment: Elevated erosion and debris flow hazards at stream crossings pose a very high risk of considerable property damage to road infrastructure. Treatment will construct drivable dips at key crossing locations on existing open roads (Trout and Ball creeks) in order to promote the movement of water and debris across the road prism and downslope in order to prevent large washouts. Existing drainage structures are not expected to manage the degree of overland flow and/or sediment and debris that is expected in the post-fire environment.

Location (Suitable) Sites: See treatment map for recommended locations.

NFSR #	NAME	Quantity
634	Trout Creek	4
432	Ball Creek	9
	Total	**13**

Road Storm Inspection and Response

Purpose of Treatment: The purpose of the monitoring is to evaluate the condition of roads for motorized access and to identify and implement maintenance of the treatments to road surfaces and flow conveyance structures. The patrols are used to identify those problems such as debris caught in culvert inlets, plugged or partially plugged culverts, and washed-out roads and to clear, clean, and/or block those roads that are or have received damage. Failure of drainage features such as culverts and rolling dips can lead to an unacceptable loss of road infrastructure. Forest personnel will survey the roads within the fire perimeter after spring runoff and summer storms. Survey will inspect road surface condition, ditch erosion, and culverts/inlet basins for capacity to accommodate runoff flows.

Location (Suitable) Sites: Please see treatment map

NFSR #	NAME	Miles/Sites
634	Trout Creek	5 miles
432	Ball Creek	6.3 miles
	TOTAL	11.3

Design/Construction Specifications:

- FS personnel will direct the work.

- Immediately upon receiving heavy rain the FS will send out patrols to identify road hazard conditions – obstructions such as rocks, sediment, washouts – and plugged culverts so the problems can be corrected before they worsen or jeopardize motor vehicle users.
- Heavy equipment necessary to mechanically remove any obstructions from the roads and culvert inlets and catch basins shall be procured when needed.
- All excess material and debris removed from the drainage system shall be placed outside of bank-full channel where it cannot re-enter stream channels.

Trail Drainage Stabilization and Select Hazard Tree Removal

Purpose of Treatment: The purpose of the trail stabilization treatments is to allow water to (1) sheet flow across the trail, and (2) where water does collect, to shed off the trail as soon as possible. Water is a trail's worst enemy, and the trail treatments are intended to minimize the time and distance that water spends on the trails by building features into the trail that shed the water. By doing these treatments, the trail prism will be protected from the increased hydrological response that is expected for post-fire storm events. Treatment may include: Install drainage (waterbars) features where needed to stabilize trail, Clean out existing waterbars, re-establish trail bench/prism as needed. Remove hazard trees, where needed, for worker safety.

Location (Suitable) Sites: Fisher Peak (Trail #27) and Russell Peak (Trail #92)

Design/Construction Specifications:

- Work will be completed by local Forest Service trail crew, as soon as it is safe for work to begin. Drainage treatments will be focused in areas of moderate to high burn severity and prioritized on steeper slopes.
- Remove hazard trees, as needed, for worker safety.

Protection/Safety Treatments:

Closure Order: It is recommended that Trout Creek (FSR 634) and Ball Creek (FSR 432) be closed until BAER treatments are implemented, hazard trees are felled (non-BAER), and slopes revegetate to mitigate post-fire watershed response (flash-flooding or debris flows).

Signage: Hazard signage will be placed at the entrance to Trout Creek (FSR 634) and Ball Creek (FSR 432) to inform public about elevated risk of visiting the Forest within the burn perimeter. Additional signage will be placed at key locations for Fisher Peak (Trail #27) and Russell Peak (Trail #92), and potential dispersed camping sites withing the fire perimeter.

I. Monitoring Narrative: Monitoring is not proposed with this funding request outside of the Early Detection Rapid Response Invasives treatments.

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Line Items	Units	Unit Cost	# of Units	BAER $	Other $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
Invasives EDRR (BAER)	acres	249	30	$7,475	$0		$0		$0	$7,475
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$7,475	$0		$0		$0	$7,475
B. Channel Treatments										
NA				$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										
Trail Drainage	mi	1,900	4	$7,885	$0		$0		$0	$7,885
Stormproofing Trout and Ball Rods	mi	7,500	11	$85,050	$0		$0		$0	$85,050
Stormproofing English Ck Rd	mi	5,300	1	$5,830						$5,830
Critical dip	ea	4,500	13	$58,500						$58,500
Storm Inspection and response	mi	1,000	11	$11,340						$11,340
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$168,605	$0		$0		$0	$168,605
D. Protection/Safety										
Trail signage	ea	216	8	$1,728	$0		$0		$0	$1,728
Road signage	ea	900	2	$1,800	$0		$0		$0	$1,800
Hazard tree felling	mi	750	11	$8,250						$8,250
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$11,778	$0		$0		$0	$11,778
E. BAER Evaluation										
Initial Assessment	Report			$23,500	$0		$0		$0	$23,500
				$0	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$23,500	$0		$0		$0	$23,500
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				$187,858	$0		**$0**		**$0**	**$211,358**
Previously approved										
Total for this request				**$187,858**						

PART VII - APPROVALS

1._____

Forest Supervisor Date