

**Date of Report: 10/31/2022****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 # 1 **All additions/changes are in red text**  
☐ Updating the initial funding request based on more accurate site data or design analysis

**PART II - BURNED-AREA DESCRIPTION****A. Fire Name:** Bolt Creek**B. Fire Number:** WA-NWS-000150**C. State:** WA**D. County:** Snohomish and King**E. Region:** R6**F. Forest:** Mt. Baker Snoqualmie**G. District:** Skykomish Ranger District**H. Fire Incident Job Code:** PNP14322(1522)**I. Date Fire Started:** 9/10/2022**J. Date Fire Contained:** 51% 10/21/2022**K. Suppression Cost:** \$14.9 Million**L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

1. Fireline repaired (miles): 2.02 miles dozer line, 0.29-miles hand line  
2. Other (identify):

**M. Watershed Numbers:***Table 1a: Acres Burned by Watershed (HUC10 in Blue; corresponding HUC12 in white)*

HUC #	Watershed Name	Watershed Acres	Acres Burned	Percent Subwatershed Burned
1711000902	Beckler River	64,586	5,532	8.6%
171100090201	Rapid River	26,387		0.0%
171100090202	Upper Beckler River	16,308	3	0.0%
171100090203	Lower Beckler River	21,891	5,529	25.3%
1711000903	South Fork Skykomish River	79,562	9,291	11.7%
171100090301	Miller River	29,214		0.0%
171100090302	Upper South Fork Skykomish River	28,233	6,255	22.2%
171100090303	Lower South Fork Skykomish River	22,115	3,036	13.7%
1711000904	North Fork Skykomish River	93,924	155	0.2%
171100090403	Lower North Fork Skykomish River	33,002	155	0.5%

*Table 1b: Watershed Breakdown by SBS*

Watershed Name	HUC 10	Watershed Acres	Soil Burn Severity				SBS Total Acres	Percent Subwatershed
			High	Moderate	Low	Unburned		
Beckler River	1711000902	64,586	948	1,263	2,465	856	5,532	8.6%
South Fork Skykomish River	1711000903	79,562	868	2,673	3,345	2,405	9,291	11.7%
North Fork Skykomish River	1711000904	93,924	1	1	112	41	155	0.2%
<b>Grand Total</b>		<b>144,148</b>	<b>1,817</b>	<b>5,921</b>	<b>3,937</b>	<b>3,302</b>	<b>14,978</b>	<b>10.4%</b>

*Table 1c: Watershed Breakdown by SBS*

Subwatershed Name	HUC 12	Subwatershed Acres	Soil Burn Severity (SBS)				SBS Total Acres	Percent Subwatershed
			High	Moderate	Low	Unburned		
Rapid River	171100090201	26,387						0.0%
Upper Beckler River	171100090202	16,308				3	3	0.0%
Lower Beckler River	171100090203	21,891	948	1,263	2,462	856	5,529	25.3%
Miller River	171100090301	29,214						0.0%
Upper South Fork Skykomish River	171100090302	28,233	820	2,157	2,291	987	6,255	22.2%
Lower South Fork Skykomish River	171100090303	22,115	48	516	1,053	1,418	3,036	13.7%
Lower North Fork Skykomish River	171100090403	33,002	1	1	112	41	155	0.5%
<b>Grand Total</b>		<b>177,150</b>	<b>1,817</b>	<b>3,937</b>	<b>5,921</b>	<b>3,302</b>	<b>14,978</b>	<b>8.5%</b>

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

Land Ownership	Soil Burn Severity				Grand Total (acres)	Percent
	High	Moderate	Low	Unburned		
Private	596	1,290	1,684	288	3,858	25.8%
State		1	40	31	73	0.5%
Forest Service	1,222	2,646	4,197	2,982	11,047	73.8%
<b>Grand Total</b>	<b>1,817</b>	<b>5,921</b>	<b>3,937</b>	<b>3,302</b>	<b>14,978</b>	<b>100.0%</b>

*Table 3b: Wilderness Summary*

Land Area	Soil Burn Severity				Grand Total (acres)	Percent
	High	Moderate	Low	Unburned		
Wilderness	622	1,716	1,209	783	4,330	29%
Non-wilderness	1,195	2,222	4,712	2,519	10,648	71%
<b>Grand Total</b>	<b>1,817</b>	<b>3,938</b>	<b>5,921</b>	<b>3,302</b>	<b>14,978</b>	<b>100%</b>

**O. Vegetation Types:** (In ascending elevation) Douglas-fir, Western Hemlock, Pacific Silver Fir, Mountain Hemlock

**P. Dominant Soils:**

Soils within the fire area are dominated by volcanic colluvium, generally ashy sandy loam and ashy loamy sand from volcanic eruptions. The soils on the steeper slopes tend to be shallow and less productive, whereas the valley bottoms to mid slopes tend to be deeper and very productive. The volcanic ash in the soils also contributes to high soil productivity, though this ashy component can be easily transported by wind and water due to its low particle density. Because productive soils produce high biomass forests, high surface fuel concentrations were predominant in the forested portions of the fire, particularly on middle and lower slopes. Where the forests burned with high fire intensity, the soils predictably were burned with high severity. Soil surveys maintained by the Natural Resources Conservation Services (NRCS) web soil survey provided soil properties necessary for analysis. The fire area is covered by the following soil surveys: Mount Baker-Snoqualmie National Forest, Washington; Snoqualmie Pass Area; and Snohomish County Area (NRCS, 2022)

**Q. Geologic Types:**

The Bolt Creek fire is underlain by several geologic units that are generally separated by north-south oriented contacts that span the burn area, according to geologic mapping by Tabor and others (1993). The oldest rocks in the burn area are early Tertiary to mid-Cretaceous rocks of the eastern mélangé belt. These highly deformed rocks underlie the burn area from Baring Mountain to the northwest extent of the fire boundary, and include mafic metavolcanic rocks, chert, argillite, greywacke, and magmatic gneiss. To the east, Klinger Ridge is underlain by Miocene and Oligocene granodiorite and granite of the Grotto Batholith. The slopes southwest of Bolt Creek are largely underlain by Eocene volcanic flows, volcanoclastic rocks, and tuff, as well as Eocene sandstone and conglomerates with interbeds of siltstone and shale. Layers within these Eocene-age rocks are moderately to steeply dipping in the burn area. The slopes in the burn area northwest of Bolt Creek are composed of the Miocene age rhyolitic to dacitic tuff, ash-flow tuff, and breccia.

Late Pleistocene alpine glaciations are responsible for carving the U-shaped glacial troughs that form the primary drainage network in the area. Thin discontinuous veneers of glacial till from these alpine deposits have been mapped in limited areas within the fire. Deposits related to the late Pleistocene Puget lobe of the Cordilleran ice-sheet have also been mapped in limited portions of the burn area along the margins of the Skykomish River valley. These deposits include glaciolacustrine clay and silt deposited in ice-dammed lakes that flooded the valley, as well as sand and gravel deposited by outwash from the receding ice sheet. Erosion of the steep slopes in the burn area has deposited alluvial fans at the mouth of many of the tributary streams, localized rock fall deposits at the base of over steepened rock outcrops, and landslides.

**R. Miles of Stream Channels by Order or Class:***Table 4: Miles of Stream Channels by Order or Class*

Stream Type	Soil Burn Severity				Outside of Fire	Grand Total (miles)
	High	Moderate	Low	Unburned		
Artificial Path			0	0	17	18
Intermittent	13	33	41	28	27	143
Perennial	1	6	10	7	11	35
<b>Grand Total</b>	<b>14</b>	<b>39</b>	<b>51</b>	<b>35</b>	<b>55</b>	<b>195</b>

**S. Transportation System:****Trails:** National Forest (miles): 8

Other (miles): 0

**Roads:** National Forest (miles): 51

Other (miles): 27

Operational Maintenance Level	Soil Burn Severity Classification					Grand Total
	High	Moderate	Low	Unburned	Outside of FS	
1 - BASIC CUSTODIAL CARE (CLOSED)	0.14	0.55	2.53	1.09	0.49	4.80
2 - HIGH CLEARANCE VEHICLES	0.90	2.03	4.88	2.52	4.65	14.98
3 - SUITABLE FOR PASSENGER CARS	1.49	3.96	11.00	3.14	5.46	25.05
5 - HIGH DEGREE OF USER COMFORT			0.56	0.00	5.60	6.16
Non-Forest Service	1.40	4.83	9.00	1.59	10.06	26.88
<b>Grand Total</b>	<b>3.93</b>	<b>11.37</b>	<b>27.96</b>	<b>8.34</b>	<b>26.26</b>	<b>77.86</b>



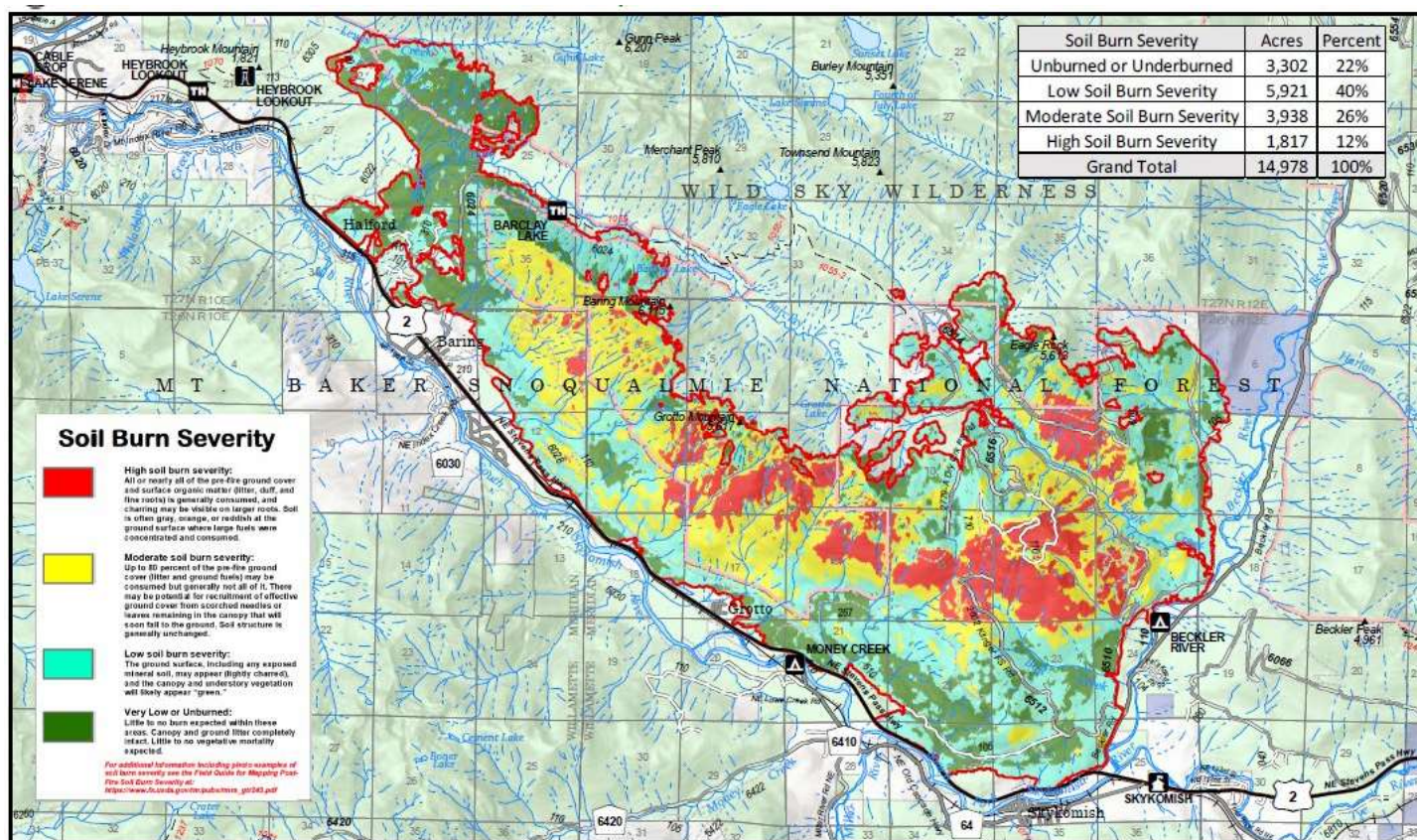
**PART III - WATERSHED CONDITION****A. Burn Severity (acres):**

Table 5a: Burn Severity Acres by Ownership

Land Ownership	Soil Burn Severity				Grand Total (acres)	Percent
	High	Moderate	Low	Unburned		
Private	596	1,290	1,684	288	3,858	25.8%
State		1	40	31	73	0.5%
Forest Service	1,222	2,646	4,197	2,982	11,047	73.8%
<b>Grand Total</b>	<b>1,817</b>	<b>5,921</b>	<b>3,937</b>	<b>3,302</b>	<b>14,978</b>	<b>100.0%</b>

Table 6a: Burn Severity Acres by Ownership (Change from Initial to Second BAER Assessment)

Soil Burn Severity	NFS Initial	NFS Interim 1	NFS Change	Non-NFS Initial	Non-NFS Interim 1	Non-NFS Change	Total Interim 1	% in Fire Perimeter
Unburned	2,005	2,982	977	205	319	114	3,301	22%
Low	2,715	4,197	1,482	993	1,724	731	5,797	40%
Moderate	2,613	2,646	33	1,177	1,291	114	3,937	26%
High	1,212	1,222	10	591	596	5	1,818	12%
<b>Total</b>	<b>8,545</b>	<b>11,047</b>	<b>2,502</b>	<b>2,966</b>	<b>3,930</b>	<b>964</b>	<b>14,977</b>	

**B. Water-Repellent Soil (acres):**

Strong and medium water repellency at the mineral surface is estimated to increase by 993 acres. This is roughly a 67% increase over background or natural water repellency for unburned conditions. Increased water repellency occurs primarily where the fire burned at high and moderate SBS, with greater likelihood in surface soils having medium- to coarse textures (sandy loam) and volcanic ash. Where it does occur the fire-induced

surface repellency is expected to be temporary, breaking down within 1 to 2 years and decreasing toward natural levels.

### C. Soil Erosion Hazard Rating:

Soil Erosion Hazard Ratings

SEH Class	Pre-fire Acres	Pre-fire Percent	Post-fire Acres	Post-fire Percent	Gain/Loss
Low	2,872	19	2,718	18	-155
Moderate	726	5	229	2	-497
High	11,378	76	12,030	80	651
<b>Total Acres</b>	<b>14,946</b>		<b>14,946</b>		

### D. Erosion Potential:

See Soil Sediment map for reference

**Sediment Delivery Rates:** Based on 20% probability, 1 year after fire

Pourshed	Acres	Average Sediment Delivery (Tons/Acre)	Total Sediment (Tons)
Bolt_Pourshed 1	679	43	28,856
Bolt_Pourshed 2	387	52	20,124
Bolt_Pourshed 3	897	62	55,614

See Soil Sediment map in Initial 2500-8 for pourshed locations.

### E. Sediment Potential: 22 to 31 tons/acre

(assumes decreases in delivered and routed sediment from total eroded volumes).

### F. Estimated Vegetative Recovery Period (years):

		Burn Severity	
Pre-fire condition	low	medium	high
early seral	0-5	1-10	1-10
mid seral	1-5	1-10	30
late seral	1-10	10-50	200

### G. Estimated Hydrologic Response (brief description):

Three HUC 10 watersheds overlap in the fire perimeter; percent area burned of these watersheds range from .2-11.7%. Within those three larger watersheds there are five subwatersheds that have had some degree of burn. Those subwatersheds include the Upper Beckler River and Lower Beckler River, located in the 5th Field Beckler River watershed; and the Upper South Fork Skykomish River, Lower South Fork Skykomish River, and the Lower North Fork Skykomish River subwatersheds located in the 5th Field South Fork Skykomish watershed. The range of percent area burned within the smaller subwatersheds range from 0.00% - 25.3%. This indicates that the large scale hydrologic response will be minimal, and concerns are specific to critical values or specific areas.

Increased discharge from post fire storm events was calculated using both local stream gages and USGS Regression equations for ungagged streams in Washington. We calculated increased discharge for a 2-year storm event, has a 50% chance of occurring in any given year and a 75% chance of occurring within the first two years after a burn event when the area has the lowest vegetation cover. A bulking factor for post fire discharge was calculated using similar techniques from two other BAER assignments in the area; one from the Norse Peak Fire on the Mt. Baker Snoqualmie and the Cougar Creek Fire on the Okanogan-Wenatchee. The Lower Beckler River is estimated to have an increase of discharge by 1.6 times and the Upper Skykomish subwatershed is estimated to have an increase of discharge by 1.5 times for post fire discharge. The Lower South Fork Skykomish River was calculated to have a 1.2x increase, while the other subwatersheds did not indicate an observable increase of discharge overall.

The responses are expected to be most evident during initial and larger storm events immediately after the fire. Thereafter, responses are expected to become less evident as vegetation is reestablished, providing ground cover, increasing surface roughness, and stabilizing and improving the infiltration capacity of the soils. The estimated vegetative recovery for watersheds affected by the fires is expected to be approximately 3 years, primarily due to the favorable growing conditions. Flood potential will decrease as vegetation reestablishes, providing ground cover, increasing surface roughness, and stabilizing and improving the infiltration capacity of the soils. Time for recovery of elevated peak flows to base flow will likely take longer than the vegetative recovery period in this region.

USGS debris flow models were run for the Bolt Creek Fire and certain drainage basins impacting Forest Service critical values were highlighted. The basin above the Bolt Creek fan is modeled as moderate debris flow hazard with the majority of the segments within the basin modeled as high debris flow hazard. A dispersed campsite exists near the active channel and Beckler Road crosses the fan downslope of the campsite. In the active channel and near the dispersed campsite, boulders approximately 4 feet in diameter were observed. The channel loses confinement where the FS 6510 road crosses the channel. Based on the modeling and field reconnaissance, flash flooding and debris flows during heavy precipitation and rain-on-snow events could impact the FS 6510 road crossing where the channel loses confinement and the dispersed campsite and the Beckler Road on the fan.

Drainage basins along the 6514 road in both the Beckler River and the Eagle Creek drainages were also highlighted as having a high risk for debris flow due to steep slopes, high soil burn severity, and unstable geology.

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

### **Introduction/Background**

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

Critical Values identified during the BAER assessment that have potential to be at risk as defined in FSM 2523.1 include human life and safety of employees and public, FS property (roads, trails, administrative, recreation infrastructure), cultural resources, natural resources including Threatened and Endangered species habitat, native plant communities, soil and water resources. The BAER team evaluated the risk to these critical values in accordance with the Interim Directive No. 2520-2019 by using the BAER risk assessment. An abbreviated version of the Bolt Creek Fire Critical Value table is included below for BAER critical values with high or very high risk rating for all resources and for very high, high, and intermediate risk rating for human life and safety. A complete version of this table including all resources and risk determinations is available upon request.

*Table 7: Critical Value Matrix*

<b>Probability of Damage or Loss</b>	<b>Magnitude of Consequences</b>		
	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>



Bolt Creek - FS Critical Value Table

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Cultural Resources	Rock Shelter 06050600057 /SK0129	Debris flow	Unlikely	Located below high burn severity on the southern aspect of steep hillside	Minor	Debris flow would either go around or over the site but will not impact integrity	Very Low	No Treatment	No Treatment
BAER critical value	Cultural Resources	Deception Camp 06050600066 /SK0123	Debris flow	Unlikely	Debris flow risk is very low from low and moderate severity hillslopes that feed into Beckler River	Minor	Unlikely a debris flow will change the river near the site.	Very Low	No Treatment	No Treatment
BAER critical value	Life and Safety	People traveling on FS Roads within or directly adjacent to fire	Flooding, debris flows, rock fall, hazard trees	Possible	Large Potential of snags, felling of trees, rock/land movement or other unforeseen timing of hazards	Major	Human safety at risk from post fire hazards	High	Road Warning Signs at Fire Perimeter, Closure	S1a. Road Hazard Signs at perimeter, S12. administrative closure of roads to public until post winter runoff
BAER critical value	Life and Safety	Money Creek Campground	Increased flow	Unlikely	River channel is large enough to handle increased flow	Moderate	Human safety at risk from post fire hazards	Low	No Treatment	No Treatment
BAER critical value	Life and Safety	Beckler River Campground	Increased flow	Unlikely	River channel is large enough to handle increased flow	Major	Human life at risk from post fire hazards	Intermediate	S1b. Trail/Recreation Hazard Signs	S1b. Trail/Recreation Hazard Signs
BAER critical value	Life and Safety	Dispersed Site on Bolt Creek	Debris flow	Very Likely	Moderate-high SBS burned hillslopes above. Historic debris flow	Major	Human life at risk from post fire hazards	Very High	S1b. Trail/Recreation Hazard Signs	S1b. Trail/Recreation Hazard Signs
BAER critical value	Life and Safety	Barclay Creek Road Snow Trail section within, or directly adjacent to, the fire and within or below High and Moderate SBS	Elevated runoff, tree and rock fall from post fire conditions	Likely	Moderate-high SBS burned hillslopes above	Major	Human life at risk from post fire hazards	Very High	S1a. Road Hazard Signs	S1a. Road Hazard Signs
BAER critical value	Life and Safety	Barclay Creek Road Snow Trail section within, or directly adjacent to, the fire and within or below Low and Un-burned SBS	Elevated runoff, tree and rock fall from post fire conditions	Unlikely	Low and un-burned SBS burned hillslopes above and below	Major	Human life at risk from post fire hazards	Intermediate	S1a. Road Hazard Signs	S1a. Road Hazard Signs
BAER critical value	Life and Safety	Barclay Lake Trailhead	No Threats Observed	Unlikely	Unburned and low SBS above	Minor	Very low risks to life and safety	Very Low	No Treatment	No treatment
BAER critical value	Life and Safety	Barclay Lake Trail	No Threats Observed	Possible	Unburned and low SBS above	Minor	Low risks to life and safety	Low	Warning Signs at Trailhead	Warning Signs at Trailhead
BAER critical value	Life and Safety	Barclay Lake Trail	No Threats Observed	Possible	Unburned and low SBS above	Minor	Low risks to life and safety	Low	Warning Signs at Trailhead	Warning Signs at Trailhead
BAER critical value	Life and Safety	Eagle Lake Trail	No Threats Observed	Unlikely	Area Unburned	Minor	Threats to life and safety unknown at this time	Very Low	No Treatment	No Treatment

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Life and Safety	Paradise Meadows Trail	No Threats Observed	Unlikely	Area Unburned	Minor	Threats to life and safety unknown at this time	Very Low	No Treatment	No Treatment
BAER critical value	Natural Resources - Soil and Water	Soil Productivity	Loss of long-term soil productivity	Possible	Loss of formerly stable organic layer, loss of soil structure, hydrophobicity, loss of soil from erosion, impacts soil microbial community occurring in moderate and high SBS areas.	Moderate	Soil conditions in moderate to high burn severity have detrimental impacts to soil structure or consumption or roots, erosion modeling.	Intermediate	G1. Mulching, G3. Soil amendments	No treatment
BAER critical value	Natural Resources - Soil and Water	Hydrologic Function	Altered hydrologic function	Likely	Lower rates of infiltration, high soil hydrophobicity, and higher rates of runoff due to loss of canopy cover, ground cover, and channel stabilizing vegetation. Reduced slope stability from moderate and high SBS areas from both rainfall and snowmelt. Increased peak flows due to higher runoff	Moderate	Hydrologic function expected to recover naturally over time and re-establishment of native vegetation to replace ground cover.	High	G1. Mulching G3. Felling logs horizontally across hillslopes	No Treatment
BAER critical value	Natural Resources - Soil and Water	Water Quality/Hydrologic Function	Post-fire seasonal sediment increases, ash, nutrient loading and/or other debris to 303 (d) streams	Possible	Based on soil burn severity and peak flow modeling, increased discharge and sedimentation will occur and lessen naturally over-time.	Minor	Minor and localized sediment effects from erosion and debris flows.	Low	Road Treatments	See road Treatments. No individual channel treatments identified. Displacement of soils will be localized and recoverable.
BAER critical value	Natural Resources - Soil and Water	Water Uses - Private Water Supply	Erosion and transport of soils, ash, and/or debris into the Skykomish River and its tributaries effected by increased post- fire flows.	Possible	Users downstream of these watersheds will likely see effects but it is not known what those effects will be and to what extent they are addressed by user.	Minor	Minor and localized sediment effects from erosion and debris flows.	Low		Coordinate with local agencies and municipalities to share data on post-fire effects.
BAER critical value	Natural Resources - T&E habitat	Critical Habitat or suitable habitat for Puget Sound Chinook salmon, steelhead and bull trout in Beckler River.	Rearing or spawning habitat degradation: smothering or scouring of redds from fine and coarse sediments or increased flows; channel instability	Likely	In the Beckler River, probability is likely due to sedimentation and debris flow potential below high/moderate burn areas with recent past flow activity. These right-bank tributaries would deliver directly to critical habitat with documented mainstem spawning and rearing.	Minor	Effects from this scale of fire activity are within the range of natural variability; areas of local habitat degradation would not result in noticeable effect to the population units of these species, which are at the Skykomish Basin, allowing for resilience to disturbance.	Low	see treatments for engineering, hydrology, geology resource areas	see treatments for engineering, hydrology, geology resource areas



Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Natural Resources - T&E habitat	Critical Habitat or suitable habitat for Puget Sound Chinook salmon, steelhead and bull trout in Beckler River.	Rearing or spawning habitat degradation: smothering or scouring of redds from fine and coarse sediments or increased flows; channel instability	Likely	In the Beckler River, probability is likely due to sedimentation and debris flow potential below high/moderate burn areas with recent past flow activity. These right-bank tributaries would deliver directly to critical habitat with documented mainstem spawning and rearing.	Minor	Effects from this scale of fire activity are within the range of natural variability; areas of local habitat degradation would not result in noticeable effect to the population units of these species, which are at the Skykomish Basin, allowing for resilience to disturbance.	Low	see treatments for engineering, hydrology, geology resource areas	see treatments for engineering, hydrology, geology resource areas
BAER critical value	Natural Resources - T&E habitat	Critical Habitat or suitable habitat for Puget Sound Chinook salmon, steelhead and bull trout in South Fork Skykomish River and lower Barclay Creek	Rearing or spawning habitat degradation: smothering or scouring of redds from fine and coarse sediments or increased flows; channel instability	Possible	In the South Fork Skykomish probability is possible due to the cumulative inputs of multiple tributaries with high to moderate burn severity combined with inputs from Beckler River. The SF is also critical habitat with spawning and rearing but has a large drainage area and larger floodplain capacity. Steelhead critical habitat in lower Barclay Creek possible to be affected due to burn along 1.5mi of Barclay with 0.4 mi across critical habitat. Burn severity was mostly un- or underburned.	Minor	Effects from this scale of fire activity are within the range of natural variability; areas of local habitat degradation would not result in noticeable effect to the population units of these species, which are at the Skykomish Basin, allowing for resilience to disturbance.	Low	see treatments for engineering, hydrology, geology resource areas	see treatments for engineering, hydrology, geology resource areas
BAER critical value	Natural Resources - T&E habitat	Critical Habitat or suitable habitat for Puget Sound Chinook salmon, steelhead and bull trout in lower Lewis Creek and North Fork Skykomish River	Rearing or spawning habitat degradation: smothering or scouring of redds from fine and coarse sediments or increased flows; channel instability	Unlikely	Lewis Creek did not have a lot of burn and did so with mostly low and un- or underburned severity in intermittent tributaries. Critical habitats are at closest 0.3 mile from the fire.	Minor	Effects from this scale of fire activity are within the range of natural variability; areas of local habitat degradation would not result in noticeable effect to the population units of these species, which are at the Skykomish Basin, allowing for resilience to disturbance.	Very Low		see Road Treatments

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Natural Resources - Native Plants	Intact native plant communities	Invasive plant establishment in areas of high burn severity.	Very Likely	Mt Baker-Snoqualmie NF priority weed species are known from areas outside of the burn perimeter, along roads. These species rapidly colonize in bare soil and high-light conditions created by high severity fires. Intact native plant communities are now threatened with alteration from introduced invasive plants or known infestations spreading into the newly disturbed and burned areas.	Moderate	Priority weed species can invade and persist in newly created complex early seral areas. Native plant communities and ecosystem functions are very difficult to restore once invasive plants are established. Invasive plants prevent native forage and pollinator habitat from developing. The optimal plan is to remove the first invading plants before a new population can establish. Priority invasive species are restricted to areas of full sunlight and do not typically persist under overstory canopy closure > 50%.	Very High	P1a. Invasives EDRR	P1a. Invasives EDRR
Other FS value	Natural Resources - Native Plants	Suppression Repair- Prevention of invasive plants in intact forest communities	Invasive plant colonization of areas disturbed by suppression	Likely	Clearing fire lines and exposed mineral soil, creating ideal conditions for new infestations to establish. Suppression and repair equipment and personnel likely moved seeds from known and unmapped populations to the newly disturbed areas.	Moderate	Considerable long- term effects to intact native plant communities. The magnitude of consequence to invaded plant communities is very high, especially in areas with very low overstory canopy closure. Native plant communities and ecosystem functions are very difficult to restore once invasive plants are established. The optimal plan is to remove the first invading plants before a new population can establish.	High	P1b. Invasives EDRR - Suppression	Invasives EDRR - Suppression

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Property - Other	Money Creek Campground	Increased flow	Unlikely	River channel is large enough to handle increased flow	Minor	Property Damage is limited to low economic investment	Very Low	No Treatment	No Treatment
BAER critical value	Property - Other	Beckler River Campground	Increased flow	Unlikely	River channel is large enough to handle increased flow	Minor	Property Damage is limited to low economic investment	Very Low	No Treatment	No Treatment
BAER critical value	Property - Other	Barclay Lake Trailhead	Increased flow	Unlikely	Low and unburned areas on hillslopes above TH	Minor	Risk is very low because of SBS	Very Low	No Treatment	No Treatment
BAER critical value	Property - Roads	All non-surveyed ML 1 roads within or directly adjacent to the fire and within or High and Moderate SBS	Elevated runoff, flooding and dry ravel, debris flows, tree and rockfall from post fire conditions	Possible	Moderate-high SBS burned hillslopes above and below	Minor	ML 1 roads are assumed to be hydrologically stable	Low	Risk Rating does not warrant treatment	No Treatment
BAER critical value	Property - Roads	All non-surveyed ML 1 roads within, or directly adjacent to, the fire and within or below Low and Un-burned SBS	Elevated runoff, flooding and dry ravel, debris flows, tree and rockfall from post fire conditions	Unlikely	Low and un-burned SBS burned hillslopes above and below	Minor	ML 1 roads are assumed to be hydrologically stable	Very Low	Risk Rating does not warrant treatment	No Treatment
BAER critical value	Property - Roads	All non-surveyed ML 2 roads within, or directly adjacent to, the fire and within or below High and Moderate SBS	Elevated runoff, flooding and dry ravel, debris flows, tree and rockfall from post fire conditions	Likely	Moderate-high SBS burned hillslopes above and below	Moderate	ML 2 road, loss of road prism, loss of access and increased sedimentation into adjacent Drainages	High	Close road, assess road	S12. Close roads administratively until they can be assessed. <b>R3. Storm Proofing and Storm Inspection and Response on portion of 6510 and 6510-105</b>
BAER critical value	Property - Roads	All non-surveyed ML 2 roads within, or directly adjacent to, the fire and within or below Low and Un-burned SBS	Elevated runoff, flooding and dry ravel, debris flows, tree and rockfall from post fire conditions	Unlikely	Low and un-burned SBS burned hillslopes above and below	Moderate	ML 2 road, loss of road prism, loss of access and increased sedimentation into adjacent Drainages	Low	Risk Rating does not warrant treatment	No Treatment

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Property - Roads	All non- surveyed ML 3 and higher roads within, or directly adjacent to, the fire and within or below High and Moderate SBS	Elevated runoff, flooding and dry ravel, debris flows, tree and rockfall from post fire conditions	Very Likely	Moderate-Low SBS burned hillslopes above and below	Major	ML 3 and higher roads represent major investment and are typically collectors and access FS infrastructure (admin/rec sites), loss of road prism, loss of access to spur roads off collectors and increased sedimentation into adjacent drainages.	Very High	Close road, assess road	S12. Close roads administratively until they can be assessed
BAER critical value	Property - Roads	All non- surveyed ML 3 and higher roads within, or directly adjacent to, the fire and within or below Low and Un-burned SBS	Elevated runoff, flooding and dry ravel, debris flows, tree and rockfall from post fire conditions	Unlikely	Low and un-burned SBS burned hillslopes above and below	Major	ML 3 and higher roads represent major investment and are typically collectors and access FS infrastructure (admin/rec sites), loss of road prism, loss of access to spur roads off collectors and increased sedimentation into adjacent drainages.	Intermediate	Risk Rating does not warrant treatment	No Treatment
BAER critical value	Property - Roads	FSR 65 - 280 Beckler River	Elevated runoff/flooding, debris flows and dry ravel, tree and rockfall from post fire conditions	Unlikely	Outside of first mile, road is on opposite side of river from the fire. First mile mostly below low and unburned SBS slopes	Major	Loss of paved, double lane, ML 5 road that is access to Beckler Campground, multiple other campgrounds, trailheads and rec sites	Intermediate	Risk Rating does not warrant treatment	No Treatment
BAER critical value	Property - Roads	FSR 6510 - Bolt Creek	Elevated runoff/flooding, debris flows and dry ravel, tree and rockfall from post fire conditions	Very Likely	Moderate-and high SBS burned hillslopes and drainages above the road	Major	Loss of ML 3 road, loss of access to Eagle Creek TH and private land via FSR 6514	Very High	Close road, remove 4-ft CMP in deep fill at unnamed crossing, outslope road, construct dip at unnamed crossing with diversion potential	S12. Close road to public and assess annually until risk has been reduced to an acceptable level, R5. construct dip to mitigate diversion potential at unnamed crossing near jct w/ FSR 6514
BAER critical value	Property - Roads	FSR 6514 - 2779 Eagle Creek	Elevated runoff/flooding, debris flows and dry ravel, tree and rockfall from post fire conditions	Very Likely	Moderate-and high SBS burned hillslopes and drainages above the road	Major	Loss of ML 3 road, loss of access to Eagle Creek TH and private land	Very High	Close road, stormproof road, remove pipes, outslope road, construct dips at crossings w/ diversion potential	S12. Close road to public and assess annually until risk has been reduced to an acceptable level, R5. construct dip at crossings w/ diversion potential, R5. improve dips with minimal humps, R1. stormproof, R4. remove crushed CMP



Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Property - Roads	FSR 6514-112	Elevated runoff/flooding, debris flows and dry ravel, tree and rockfall from post fire conditions	Unlikely	Roadway has been obliterated/recontour ed from the 6514110 junction through the first visible drainage.	Minor	Road appears to be decommissioned and hydrologically stable	Very Low	Risk Rating does not warrant treatment	No Treatment
BAER critical value	Property - Roads	FSR 6028 Baring Mountain	Elevated runoff/flooding and dry ravel, tree and rockfall from post fire conditions	Likely	Moderate-and high SBS burned hillslopes and drainages above the road	Moderate	ML 2 road, loss of road prism, road prism failure to deposit on rail tracks/Hwy 2 below. Increased sedimentation into Skykomish River	High	Storm proof, storm inspection/response, construct dips to mitigate diversion potential , close road	S12 close road using existing gate
BAER critical value	Property - Roads	Money Creek Bridge on FSR 6030 at MP 0.3	Scour from elevated runoff, logjams, debris flows, washout from post fire conditions	Unlikely	North pier cast on bedrock, bridge downstream of bend were LWD appears to be collecting and river upstream lacks confinement for carrying debris flows long distances	Major	Loss of Bridge, loss of major economic investment, loss of access Money Creek CG	Intermediate	Risk Rating does not warrant treatment	No Treatment
BAER critical value	Property - Roads	Bolt Creek Bridge on FSR 65 MP 0.94	Scour from elevated runoff, logjams, debris flows, washout from post fire conditions	Possible	Moderate-and high SBS burned hillslopes and drainages above the crossing	Major	Loss of Bridge, loss of major economic investment, loss of access Beckler Road (ML 5) and Beckler Campground, multiple other campgrounds, trailheads and rec sites	High	Remove bridge, storm inspection/response w/ heavy equipment	R3. Storm inspection/response w/ heavy equipment
BAER critical value	Property - Roads	1st Xing Beckler Bridge on FSR 65 at MP 1.00	Scour from elevated runoff, logjams, debris flows, washout from post fire conditions	Unlikely	Bridge downstream and upstream of historical debris flows and river upstream lacks confinement for carrying debris flows long distances	Major	Loss of Bridge, loss of major economic investment, loss of access Beckler Road (ML 5) and Beckler Campground, multiple other campgrounds, trailheads and rec sites	Intermediate	Risk Rating does not warrant treatment	No Treatment
BAER critical value	Property - Roads	Upper Bolt Creek Bridge on FSR 6510 at MP 0.436	Scour from elevated runoff, logjams, debris flows, washout from post fire conditions	Possible	Moderate-and high SBS burned hillslopes and drainages above the crossing	Major	Loss of Bridge, loss of major economic investment, loss of access to Eagle Creek TH	High	Remove bridge, storm inspection/response w/ heavy equipment	R3. Storm inspection/response w/ heavy equipment
BAER critical value	Property - Roads	Upper Eagle Creek Bridge on FSR 6514 at MP 5.3	Scour from elevated runoff, logjams, debris flows, washout from post fire conditions	Unlikely	Bridge is upslope and outside the fire at the time of field assessment	Major	Loss of Bridge, loss of major economic investment, loss of access to upper Eagle Creek	Intermediate	Risk Rating does not warrant treatment	No Treatment

Value	Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
BAER critical value	Property - Roads	Barclay Bridge on FSR 6024 at MP 0.2	Scour from elevated runoff, logjams, debris flows, washout from post fire conditions	Possible	Unable to assess bridge due to fire behavior/suppression activities and time	Major	Loss of Bridge, loss of major economic investment, loss of access Barclay Lake TH and Snowmobile route	High		Assess bridge when safe fire behavior/suppression activities allow and submit interim request if an unacceptable risk exists to the crossing
BAER critical value	Property - Roads	FSR 6024- Barclay Lake	No Threats Observed	Possible	Unburned and low SBS above	Minor	Very low risks to life and safety	Low	No Treatment	No Treatments
BAER critical value	Property - Roads	FSR 6512	Scour from elevated runoff, logjams, debris flows, washout from post fire conditions	Very Likely	Large amounts of moderate and high severity burn areas adjacent to road and above that feed into stream crossing	Moderate	Access to part of forest for future vegetation management. Doesn't lead to any recreation sites or trails. Loss of part of road prism.	Very High	Risk rating warrants storm proofing and inspection	<b>R1. Storm Proofing and R3. Storm Inspection and Response</b>
BAER critical value	Property - Trails	Barclay Creek Road Snow Trail section within, or directly adjacent to, the fire and within or below High and Moderate SBS	Increased flow causing trail prism and drainage structure failures	Likely	Moderate-high SBS burned hillslopes above	Moderate	Loss of trail prism	High	Assess trail prism for drainage, treatment for road 6024 will apply to this trail- they share the same surface	Treatment for road 6024 will apply to this trail- they share the same surface
BAER critical value	Property - Trails	Barclay Creek Road Snow Trail section within, or directly adjacent to, the fire and within or below Low and Un-burned SBS	Increased flow causing trail prism and drainage structure failures	Unlikely	Low and un-burned SBS burned hillslopes above and below	Moderate	Loss of trail prism	Low	No Treatment	No Treatment
BAER critical value	Property - Trails	Barclay Lake Trail (Bridges)	No Threats Observed	Unlikely	Area above is unburned or has low intensity SBS	Minor	There is minimal threat to property from post-fire flooding or debris flows.	Very Low	No Treatment	No Treatment
BAER critical value	Property - Trails	Eagle Lake Trail	No Threats Observed	Unlikely	Area Unburned	Minor	Threats to property unknown at this time	Very Low	No Treatment	No Treatment
BAER critical value	Property - Trails	Paradise Meadows Trail	No Threats Observed	Unlikely	Area Unburned	Minor	Threats to property unknown at this time	Very Low	No Treatment	No Treatment

**B. Emergency Treatment Objectives:**

The primary objective of this Burned Area Emergency Response Report is to recommend treatments to manage identified unacceptable risks from “imminent post-wildfire threats to human life and safety, property, and critical natural resources on National Forest System lands” (FSM 2523.02). These treatments are expected to substantially reduce the probability of damage to identified BAER critical values.

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

Land: NA

Channel: NA

Roads/Trails: 75

Protection/Safety: 90

**D. Probability of Treatment Success**

Table 8: 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>	80	80	80
<b>Protection/Safety</b>	90	90	90

**E. Cost of No-Action (Including Loss): \$946,686****F. Cost of Selected Alternative (Including Loss): \$189,337 with a cost/benefit ratio of 4.4.****G. Skills Represented on Burned-Area Survey Team:**

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

**Team Leader:** Joe Blanchard

**Email:** joseph.blanchard@usda.gov

**Phone(s)** 203-241-7340

**Second Team Leader:** John Chatel

**Phone(s)** 971-801-5379

**Email:** john.chatel@usda.gov

**Forest BAER Coordinator:** John Kelley

**Email:** john.kelley@usda.gov

**Phone(s):** 760-660-4189

**Team Members:** Table 9: BAER Team Members by Skill

<b>Skill</b>	<b>Second Team Member Names</b>
<b>Team Lead</b>	John Chatel
<b>Assistant Team Lead</b>	John Kelley
<b>Soils</b>	Terry Hardy
<b>Hydrology</b>	Rae Kursky
<b>Fisheries</b>	Karen Chang
<b>Engineering (t)</b>	Jamison Humburg
<b>GIS</b>	Dave Keenum
<b>Archaeology</b>	Megan Berryoung
<b>Weeds</b>	Shauna Hee
<b>Recreation</b>	Eric Amstad
<b>Geologist</b>	Kate Michelson (WA DNR)

<b>Skill</b>	<b>Second Team Member Names</b>
<i>PIO</i>	Christine Pyle

<b>Skill</b>	<b>First Team Member Names</b>
<i>Team Lead(s)</i>	Joe Blanchard
<i>Soils</i>	Ryan Sparhawk
<i>Hydrology</i>	Kacey Largent
<i>Hydrology (t)</i>	Rae Kursky
<i>Fisheries</i>	Karen Chang
<i>Engineering</i>	Ken Bigelow
<i>GIS</i>	Dave Keenum
<i>Archaeology</i>	Megan Berryoung
<i>Weeds</i>	Kevin James
<i>Recreation</i>	Brent Freeman
<i>Geologist</i>	Kate Michelson (WA DNR)
<i>PIO</i>	Amy Linn

## H. Treatment Narrative:

### Land Treatments:

#### **EDRR BAER - P1a**

Known invasive plant occurrences near moderate and high severity burn areas across six locations total 7.12 acres would receive detection surveys and subsequent treatments. Positive plant detections will be treated on the spot either manually or with herbicide. Early detection surveys and rapid response treatments are the best option for managing new invaders that exist within or adjacent to the fire perimeter that have a high likelihood of aggressively colonizing the burned area. Most of the targeted species have rhizomes that survive any intensity of fire, and reproduce primarily through copious seed production. BAER funding authorization will be used to meet EDRR objectives during the spring and summer of FY23. A GIS layer of invasive plant occurrences needing surveys can be found in the BAER Assessment's T drive folder.

#### **Suppression EDRR - Pba**

Suppression lines totaling approximately 5.4 miles in length (15.2 acres) across NFS lands would receive detection surveys and subsequent treatments. Of the suppression lines, 3.0 miles are completed dozer lines, 0.3 miles of hand lines, 2.1 miles were closed or decommissioned roads that were reopened and access improved, and 0.1 miles were fuel breaks. Early detection surveys and rapid response treatments are the best option for managing new invaders that were introduced or spread as a result of suppression actions. A GIS layer of suppression lines needing surveys can be found in the BAER Assessment's T drive folder.

<b>FISCAL YEAR</b>	<b>UNIT</b>	<b>UNIT COST</b>	<b># OF UNITS</b>	<b>COST</b>
<b>FY 23 – BURN AREA</b>	Acre	\$1,391	7.12	\$9,904
<b>FY23 - SUPPRESSION</b>	Acres	\$652	15.2	\$9,910

**Channel Treatments: None**

**Roads and Trail Treatments:**

#### **Storm Proofing - R1 - Clean inlet/Catch Basin/Culverts/Ditches & Lead off ditches**

- Objective: Provide an intercept path for sheet flows off fire-impacted slopes and associated debris without filling in and diverting flow into the traveled-way of the road.



- Description: Clean existing inlets and catch basins, Dig ditch, waterbars and dips deeper than existing to increase capacity where particularly high runoff is expected to occur based on hydrological models.  
First BAER Assessment and its corresponding burn area, shows \$4,100 per mile.
- Additional Treatments from the second BEAR assessment include clean existing inlets, catch basins, Dig ditches, waterbars and dips deeper than existing to increase capacity where particularly high runoff is expected to occur based on hydrological models. Remove earthen berms off outside edge of road where it could prevent water from exiting roadway and blade road to remove high spots to facilitate drainage over and off roadway.  
Second BAER Assessment and its corresponding burn area, shows \$8,556 per mile.

#### **Construct Drainage Dip - R2a-1**

- Objective: Provide relief flow path for flooded roadway or overwhelmed culvert crossings to minimize diversion potential, associated erosion, and subsequent damage of road prism.
- Description: Excavate a drivable dip in road surface that will safely pass flow from overwhelmed drainage. \$4,300 Each
- Not part of the Second BAER Assessment area.

#### **Improve Drainage Dip - R2a-2**

- Objective: Repair and reinforce existing drainage features that provide relief flow path for flooded roadway or overwhelmed culvert crossings to minimize diversion potential, associated erosion, and subsequent damage of road prism.
- Description: Excavate more 'trough' and build up the 'hump' of existing drain dips for a more robust drainage feature with a lower probability of failure to divert runoff and a high capacity. \$1000 Each.
- Not part of the Second BAER Assessment area.

#### **Storm Inspection and Response – R3a**

- Objective: Monitor road drainage features, armoring, and other treatments as they respond to significant storm events and subsequently repair damages that compromise the effectiveness of these efforts.
- Description: Inspection by qualified persons, determination of effectiveness, coordination of treatment restoration including bringing out equipment if needed.
- First BAER Assessment and its corresponding burn area, shows \$4,000 per mile.
- The Second BAER Assessment burn area will need patrols, which are used to identify those road problems such as filled ditches, plugged culverts and washed-out roads and to clear, clean, and/or block those roads that are or have received damage. The storm patrollers shall have access to at least a backhoe and dump truck that can be used when a drainage culvert is plugged or soon to be plugged and to repair any road receiving severe surface erosion.
- District personnel will survey the roads within or adjacent to the fire perimeter during Fall rain events and during Spring runoff. Surveys will inspect road surface condition, ditch erosion, rolling drain dip failure, and culverts/inlet basins for capacity to accommodate runoff flows.
- Second BAER Assessment and its corresponding burn area, shows \$10,037 per mile.

#### **Storm Inspection and Response with Heavy Equipment - R3b**

- Objective: Monitor bridge openings for logjams/debris flows or scour. Mobilizing heavy equipment to clear opening and maintain hydraulic capacity prior to failure of bridges. Assumes 2 days of time for equipment and emergency mobilization. Response requires heavy equipment with multiple personnel to ensure existing drainage and road remain in functional status.
- Description: The Bolt Creek (FSR 65) and Upper Bolt Creek (FSR 6510) Bridges openings that if partially or fully blocked by debris would require heavy equipment and personnel to clean out the hydraulic opening and maintain functional statue. For treatment cost estimates it would be up to two days cleaning out hydraulic openings of the culverts and bridges and likely require an excavator, dump truck, sawyer, swamper and laborer. Given the uncertainty of timing and emergency nature of responding a \$2,000 mobilization cost was added to the cost estimate.

Inspection by qualified persons, determination of effectiveness, coordination of treatment restoration. \$12,600 for each site.

- This is only for the first BAER Assessment and its corresponding burn area.

<b>Storm Inspection with Heavy Equipment Response Costs</b>			
<i><b>Equipment/Worker</b></i>	<i><b>Rate/Hr</b></i>	<i><b>Hrs</b></i>	<i><b>Costs</b></i>
Excavator	\$200.00	20	\$4,000.00
Dump Truck	\$120.00	20	\$2,400.00
Swamper	\$60.00	20	\$1,200.00
Laborer	\$45.00	20	\$900.00
Sawyer	\$55.00	20	\$1,100.00
Subtotal =			\$9,600.00
\$3,000 Emergency Mobilization =			\$3,000.00
<b>Total =</b>			<b>\$12,600.00</b>

### **Infrastructure Removal – S8**

- Objective: Removal of infrastructure that is expected to fail to reduce sedimentation and reduce risk to public safety.
- Description: Remove damaged culvert and slope fill back to more natural slope. Shape road to make road still passable to traffic for private access. \$1,000 each.
- This is only for the first BAER Assessment and its corresponding burn area.

**Bolt Creek BAER First Assessment, Proposed Road Treatment Cost Breakdown**

Road	ML	Unit Costs	\$4,000.00	\$12,600.00	\$4,300.00	\$1,000.00	\$4,100.00	\$21,368.72	\$1,000.00	\$750.00	\$221,400.00	Cost to Treat Road	Cost to Treat per Mile
		Treated Miles	*Storm Inspection & Response (Miles) - R3a	*Storm Inspection & Response w/ Heavy Equipment - R3b	Drain Dip (Each) R2a-1	Improve Dip (Each) R2a-2	Storm Proof - Clean inlet/Catch Basin/Ditches (Mile) - R1	Treat Unsurveyed portion of FSR 6514	Remove Infrastructure, Culvert - S8	Warning Sign - S1a	Cost to Not Treat Road		
6510 - Bolt Creek	3	0.9	0	0	1	0	0	0	0	NA	\$199,260.00	\$4,300.00	\$4,777.78
6514 - Eagle Creek (surveyed)	3	3.58	3.28	0	5	1	7	0	1	NA	\$792,612.00	\$65,320.00	\$18,245.81
Bolt Creek Bridge FSR 6500	5	NA	0	1	0	0	0	0	0	NA	\$983,950.00	\$12,600.00	NA
Upper Bolt Creek Bridge on FSR 6510	3	NA	0	1	0	0	0	0	0	NA	\$688,022.00	\$12,600.00	NA
6514 - Eagle Creek (unsurveyed)	3	5.22	1.5	0	0	0	0	1.5	0	NA	\$983,950.00	\$38,053.07	\$18,245.81
Warning Signs At Fire Perimeter & at Recreational Sites	NA	NA	NA	NA	NA	NA	NA	NA	NA	8	NA	\$6,000.00	NA
<b>Bolt Creek BAER</b>	<b>Totals</b>	<b>9.7</b>	<b>4.78</b>	<b>2</b>	<b>6</b>	<b>1</b>	<b>7</b>	<b>1.5</b>	<b>1</b>	<b>8</b>	<b>\$3,647,794.00</b>	<b>\$138,873.07</b>	<b>\$14,316.81</b>

**Bolt Creek BAER Second Assessment, Proposed Road Treatment Cost Breakdown (In addition to the First Assessment)**

Road	ML	Unit Costs	\$1,820.00	\$8,556.00	\$221,400.00	Cost to Treat Road	Cost to Treat per Mile
		Treated Miles	*Storm Inspection & Response (Days) - R3a	Storm Proof - Clean inlet/Catch Basin/Ditches /Berm removal (Each) - R1	Cost to Not Treat Road		
6510 - Bolt Creek	3	1.0	5	0	\$221,400.00	\$9,100.00	\$9,100.00
6510-105 - Spur off Bolt Creek	2	0.47	5	0	\$104,058.00	\$9,100.00	\$19,361.70
6512- 2602 Klinger	3	1.25	5	1.25	\$276,750.00	\$19,795.00	\$15,836.00
<b>Bolt Creek BAER</b>	<b>Totals</b>	<b>2.72</b>	<b>15</b>	<b>1.25</b>	<b>\$602,208.00</b>	<b>\$37,995.00</b>	<b>\$13,968.75</b>

**Bolt Creek BAER First Assessment Area  
USFS Treatment Schedule**

Treatment	Unit	Unit Cost	Quantity	Cost Carson
Storm Proof - Clean inlet/Catch Basin/Ditches (Mile) - R1	MILE	\$4,100.00	7	\$28,700.00
Drain Dip (Each) R2a-1	EACH	\$4,300.00	6	\$25,800.00
Improve Dip (Each) R2a-2	EACH	\$1,000.00	1	\$1,000.00
Storm Inspection & Response (Miles) - R3a	MILE	\$4,000.00	4.78	\$19,120.00
Storm Inspection & Response w/ Heavy Equipment - R3b	EACH	\$12,600.00	2	\$25,200.00
Treat Un-surveyed portion of FSR 6514*	MILE	\$21,368.72	1.5	\$32,053.07
Remove Infrastructure, Culvert - S8	EACH	\$1,000.00	1	\$1,000.00
<b>Totals =</b>				<b>\$132,873.07</b>

\*Cost per mile of treating un-surveyed portion of FSR 6514 was determined by assuming the same cost per mile as treating the moderate and high soil burn severity sections that were surveyed by engineers. The entire 6514 road was included in this initial BAER request due to the high risk of road failure and the very short window for implementation this fall.

**Bolt Creek BAER Second Assessment  
USFS Treatment Schedule (In addition to the First Assessment)**

Treatment	Unit	Unit Cost	Quantity Carson	Cost Carson
Storm Proof - Clean inlet/Catch Basin/Ditches/Berm removal (Miles) - R1	MILE	\$8,556.00	1.25	\$10,695.00
Storm Inspection & Response (Days) - R3a	DAYS	\$1,820.00	15	\$27,300.00
<b>Bolt Creek BAER Totals =</b>				<b>\$37,995.00</b>



**Protection/Safety Treatments:****Install Road Hazard/Warning Signs - S1a**

- Objective: Notify public of potential road hazards and unsafe conditions.
- Description: Install signs at Forest entry points and replace fire damaged warning signs. Cost includes ordering all material (sign panels, posts, wind bracing and connection hardware) plus time and equipment to install. \$750 each

**iBolt Creek BAER Assessment Area - USFS Treatment Schedule**

Treatment	Unit	Unit Cost	Quantity	Cost Carson
Warning Sign - S1a	EACH	\$750.00	8	\$6,000.00
<b>Total =</b>				<b>\$6,000.00</b>

**Install Road Hazard/Warning Signs - S1b**

- Objective: Notify public of potential road hazards and unsafe conditions
- Description: Signs warning the public of hazards should be applied at the entrance Beckler River CG, Money Creek CG and the dispersed camping area on Bolt Creek to warn users "Flash Flood Area, Fallen Trees, Rock and Debris" because these sites are not adjacent to the burn, but are at risk of flash flooding and debris flow.

**Bolt Creek BAER First Assessment Area**

Signs to notify and warn the public of the hazards				
Rec site name	Sign number	Cost	Amount	\$
Campgrounds	(FW8-14f) 48 X 24 – 4C- INCH LETTERS	\$700.00	2	\$1400.00
Dispersed site on Bolt Creek	(TFW8-14f) 14 X 8 – 1B-INCH LETTERS	\$400.00	1	\$400.00
Posts/Hardware		\$240.00		\$240.00
Overtime for coordination and install		\$1920.00		\$1920.00
<b>Total funding requested:</b>				<b>\$3,960.00</b>

**Bolt Creek BAER Second Assessment Area**

Signs to notify and warn the public of the hazards				
Rec site name	Sign number	Cost	Amount	\$
Trail Heads (Barclay Lake TH)	(TFW8-14d) 12 X 10 –1B-INCH LETTERS	\$1,220.00	1	\$1,220.00
<b>Total funding requested:</b>				<b>\$1,220.00</b>

**Physical Closure Device – Type III Barricade – S2a**

- Objective: Temporarily close the road until next season when the road can be assessed
- Description: Install barricades at road entry points and sandbags to supply deadweight in order to keep upright in winds. Cost includes ordering all material (barricades, sandbags) plus time to install. \$500 each for type III barricade.
- A type III barricade was determined to be ineffective at the 6514 road location, so a hard closure device is needed. The hard closure needs to allow access to Tribal and private landowners, so a gate is needed instead of concrete barrier. In addition, risk to the public is very high on this road compared to other roads in the fire area.

**Bolt Creek BAER First Assessment Area - USFS Treatment Schedule**

Treatment	Unit	Unit Cost	Quantity Carson	Cost Carson
Physical Closure Device (Type III Barricade) -S2 (Each)	EACH	\$500.00	9	\$4,500.00
<b>Bolt Creek BAER Totals =</b>				<b>\$4,500</b>

**Physical Closure Device – ‘Powder River’ Style Gate – S2b**

- Objective: Provide a more effective hard closure to the highest risk area while maintaining access for private and tribal land.
- Description: Install ‘Powder River’ Style gate at road entry point with locking posts in concrete (footings or anchored into ecology blocks). Cost includes all material, freight plus time to install
  - \$3,000 each

**Bolt Creek BAER First Assessment Area - USFS Treatment Schedule**

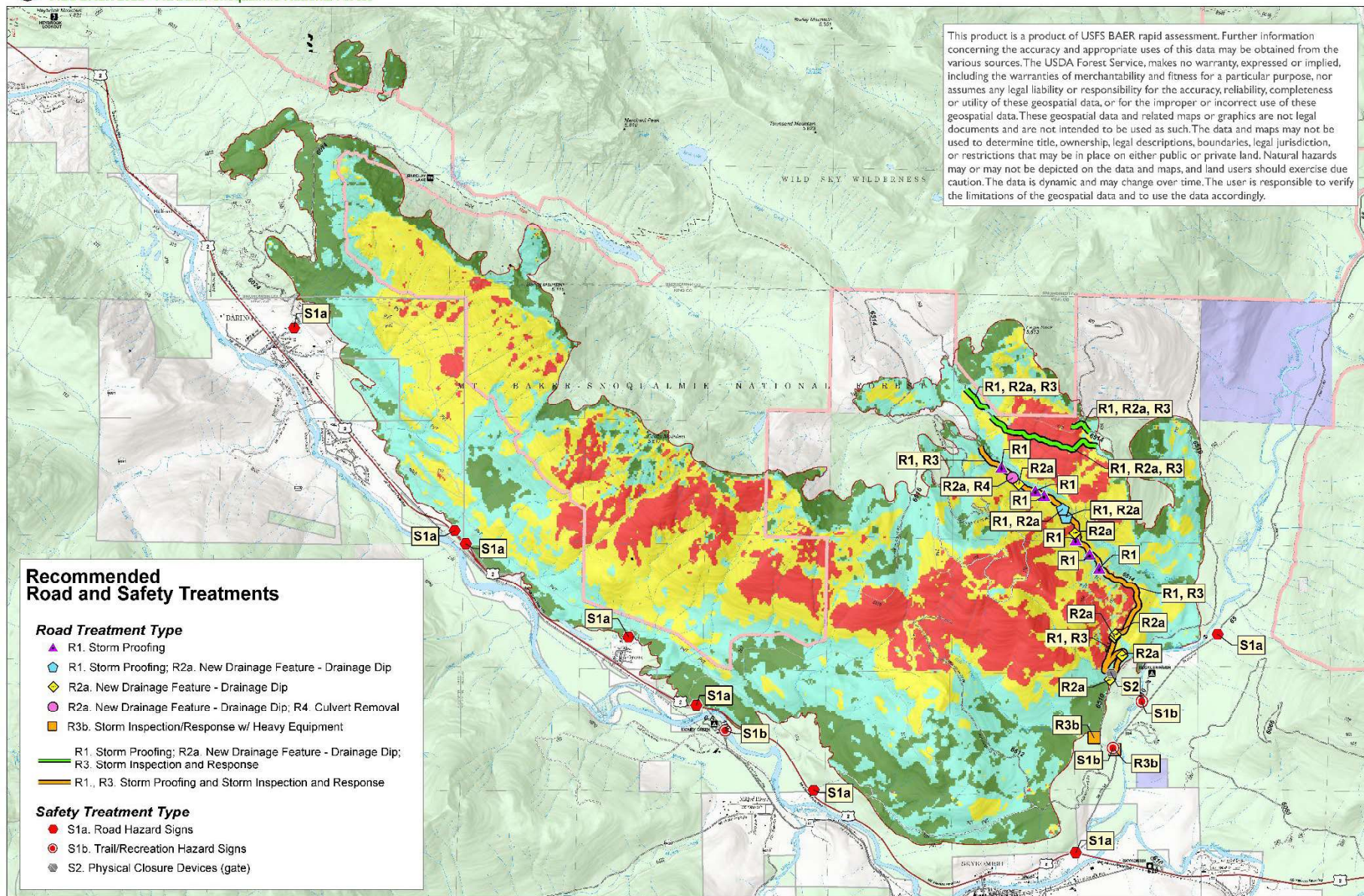
Treatment	Unit	Unit Cost	Quantity Carson	Cost Carson
Physical Closure Device (‘Powder River’ Style Gate) -S2b (Each)	EACH	\$3,000.00	1	\$3,000.00
<b>Bolt Creek BAER Totals =</b>				<b>\$3,000</b>



## MBS BAER 2022 - Mt. Baker-Snoqualmie National Forest

This product is a product of USFS BAER rapid assessment. Further information concerning the accuracy and appropriate uses of this data may be obtained from the various sources. The USDA Forest Service, makes no warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, nor assumes any legal liability or responsibility for the accuracy, reliability, completeness or utility of these geospatial data, or for the improper or incorrect use of these geospatial data. These geospatial data and related maps or graphics are not legal documents and are not intended to be used as such. The data and maps may not be used to determine title, ownership, legal descriptions, boundaries, legal jurisdiction, or restrictions that may be in place on either public or private land. Natural hazards may or may not be depicted on the data and maps, and land users should exercise due caution. The data is dynamic and may change over time. The user is responsible to verify the limitations of the geospatial data and to use the data accordingly.

- S1a. Road Hazard Signs
- S1b. Trail/Recreation Hazard Signs
- S2. Physical Closure Devices (gate)



**Disclaimer**  
The authors do not warrant the accuracy or completeness of the information contained in this document. The authors assume no responsibility for any errors or omissions. The authors do not warrant the accuracy or completeness of the information contained in this document. The authors assume no responsibility for any errors or omissions. The authors do not warrant the accuracy or completeness of the information contained in this document. The authors assume no responsibility for any errors or omissions.

-  Fire Boundary
-  Well
-  Drinking Water
-  Stream Flow
-  Building Footprint

-  Ranger District
-  Campground
-  Lookout
-  Trailhead

 Primary Highway  
 Paved Road  
 Gravel Road

— Dirt (Not Paved)  
 — Unimproved Roads  
 — Closed Roads

..... Trail  
 ——— Tunnel, Bridge  
 ——— Railroad

 Ranger District Boundary  
 FS Wilderness Boundary  
 Forest Service Land

Miles  
 State Land  
 Private, Local Government, Undesignated

—★—



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

Line Items	Units	Unit Cost	NFS Lands		Other	Other Lands				All Total
			# of Units	BAER \$		# of units	Fed \$	# of Units	Non Fed \$	
<b>A. Land Treatments</b>										
EDRR P1a	Acre	\$400	4,394	7.12 \$2,848	\$9,904		\$0		\$0	\$9,904
EDRR P1b	Acre	\$400	652	15.2 \$6,080	\$9,910		\$0		\$0	\$9,910
<i>Subtotal Land Treatments</i>				\$19,814	\$0		\$0		\$0	\$19,814
<b>B. Channel Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>C. Road and Trails</b>										
R1- Storm Proof	MILE	8,556	1	\$10,695	\$0					
R1- Storm Proof	MILE	4,100	7	\$28,700	\$0		\$0		\$0	\$28,700
R2a-1 Drain Dip	EACH	4,300	6	\$25,800	\$0		\$0		\$0	\$25,800
R2a-2 Improve Dip	EACH	1,000	1	\$1,000	\$0					\$1,000
R3a- Storm Inspection & Response	MILE	10,037	3	\$27,301			\$0		\$0	\$27,301
R3a- Storm Inspection & Response	MILE	4,000	5	\$19,120	\$0					\$19,120
R3b- Storm Inspection & Response w/ Heavy Equipment	EACH	12,600	2	\$25,200	\$0					\$25,200
FSR 6514 Trt	MILE	21,369	2	\$32,053	\$0					\$32,053
S8- Remove Culvert	EACH	1,000	1	\$1,000	\$0					\$1,000
				\$0	\$0					\$0
<i>Subtotal Road and Trails</i>				\$160,174	\$0		\$0		\$0	\$160,174
<b>D. Protection/Safety</b>										
S1a- Warning Signs	EACH	1,220	1	\$1,220	\$0		\$0		\$0	\$1,220
S1b- Warning Signs	EACH	1,320	3	\$3,960	\$0		\$0		\$0	\$3,960
S1b- Warning Signs	EACH	1,320	3	\$3,960	\$0		\$0		\$0	\$3,960
S2a- Road Barricade	EACH	500	9	\$4,500			\$0		\$0	\$4,500
S2b- Road Gate	EACH	3,000	1	\$3,000			\$0		\$0	\$3,000
<i>Subtotal Protection/Safety</i>				\$16,640	\$0		\$0		\$0	\$16,640
<b>E. BAER Evaluation</b>										
Initial Assessment	Report	\$60,000	1	\$60,000	\$0		\$0		\$0	\$60,000
Second Assessment	Report	\$17,028	1	\$17,028	\$0		\$0		\$0	\$17,028
<i>Subtotal Evaluation</i>				\$77,028	\$0		\$0		\$0	\$77,028
<b>F. Monitoring</b>										
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$0	\$0		\$0		\$0	\$0

**PART VII - APPROVALS**

MICHAEL

SCHLAFMANN

Digitally signed by MICHAEL  
SCHLAFMANN

Date: 2022.11.03 17:40:13

-07'00'

1. Forest Supervisor

for Jody Weil

11/03/2022

Date