

Date of Report: 10/5/2022

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: 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: 36% contained as of 10/5/2022

K. Suppression Cost: ██████████

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

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

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
1711000902	Beckler River	64,586	3,968	6%
171100090203	Lower Beckler River	21,891	3,968	18%
1711000903	South Fork Skykomish River	79,562	7,543	9%
171100090302	Upper South Fork Skykomish River	28,233	5,923	21%

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
171100090303	Lower South Fork Skykomish River	22,115	1,620	7%

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	8,545
OTHER FEDERAL (LIST AGENCY AND ACRES)	
STATE	
PRIVATE	2,966
TOTAL	11,511

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, volcaniclastic 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 responsibly 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 Cordillera 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 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	32
INTERMITTENT	124
EPHEMERAL	
OTHER (ARTIFICIAL PATH)	18

S. Transportation System:

Trails: *National Forest (miles):* 5

Other (miles):

Roads: *National Forest (miles):*

Other (miles):

Operational Maintenance Level	Soil Burn Severity Classification				Grand Total
	High	Moderate	Low	Unburned	
1 - BASIC CUSTODIAL CARE (CLOSED)	0.1	0.5	2.0	1.9	4.5
2 - HIGH CLEARANCE VEHICLES	0.9	2.0	3.2	5.8	11.9
3 - SUITABLE FOR PASSENGER CARS	1.5	3.5	5.5	13.7	24.2
5 - HIGH DEGREE OF USER COMFORT	0.0	0.0	0.0	0.7	0.7
Non-Forest Service	1.4	4.7	7.0	13.8	26.9
Grand Total	3.9	10.7	17.7	35.9	68.2

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

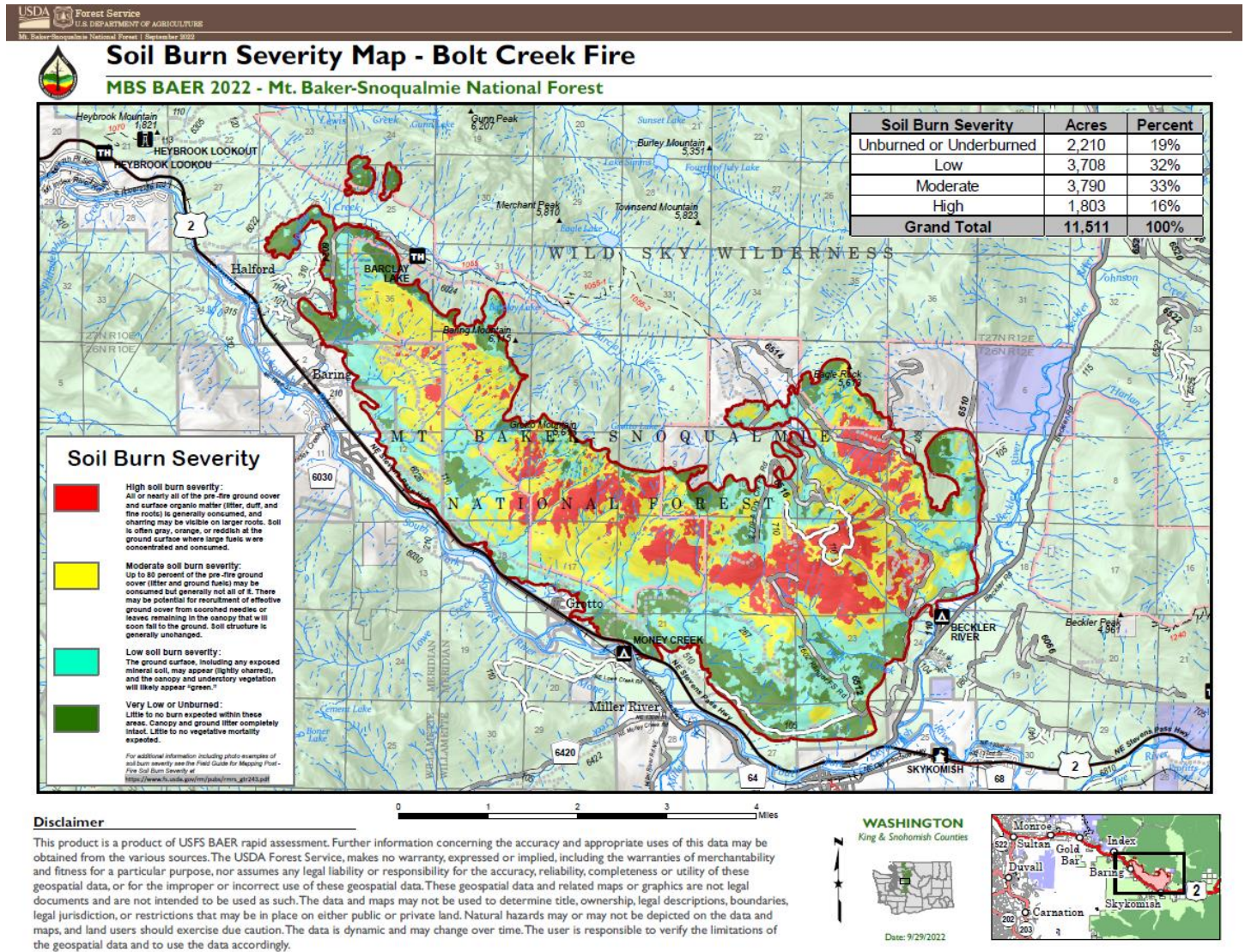


Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	Other Federal (List Agency)	State	Private	Total	% within the Fire Perimeter
Unburned	2,005			205		19%
Low	2,715			993		32%
Moderate	2,613			1,177		33%
High	1,212			591		16%
Total	8,545			2,966		100%

B. Water-Repellent Soil (acres): Soils across the fire have natural hydrophobicity

C. Soil Erosion Hazard Rating:

Soil Erosion Hazard Ratings

Erosion Risk	Erosion Risk (acres)	Erosion Risk (%)
Low	2,244	20%
Moderate	3,772	33%
High	3,729	32%
Very High	1,766	15%
Grand Total	11,511	100%

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	42.5	42,570
Bolt_Pourshed 2	387	51.82	30,058
Bolt_Pourshed 3	897	61.81	61,171

E. Sediment Potential: 0.015 to 103 tons/acre

F. Estimated Vegetative Recovery Period (years):

Pre-fire condition	Burn Severity		
	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 6th Field subwatersheds overlap with the fire perimeter; percent area burned of these watersheds range from 7-21%. Those subwatersheds include the Lower Beckler River subwatershed located in the 5th Field Beckler River watershed, and the Upper South Fork Skykomish River and Lower Skykomish subwatersheds located in the 5th Field South Fork Skykomish watershed.

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, because that event has a 50% probability of occurring in any given year. 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 and the Upper Skykomish subwatersheds have the highest percentage burned area and calculated a 1.5x increase for post fire discharge, and The Lower South Fork Skykomish River was calculated to have a 1.2x increase.

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 are 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

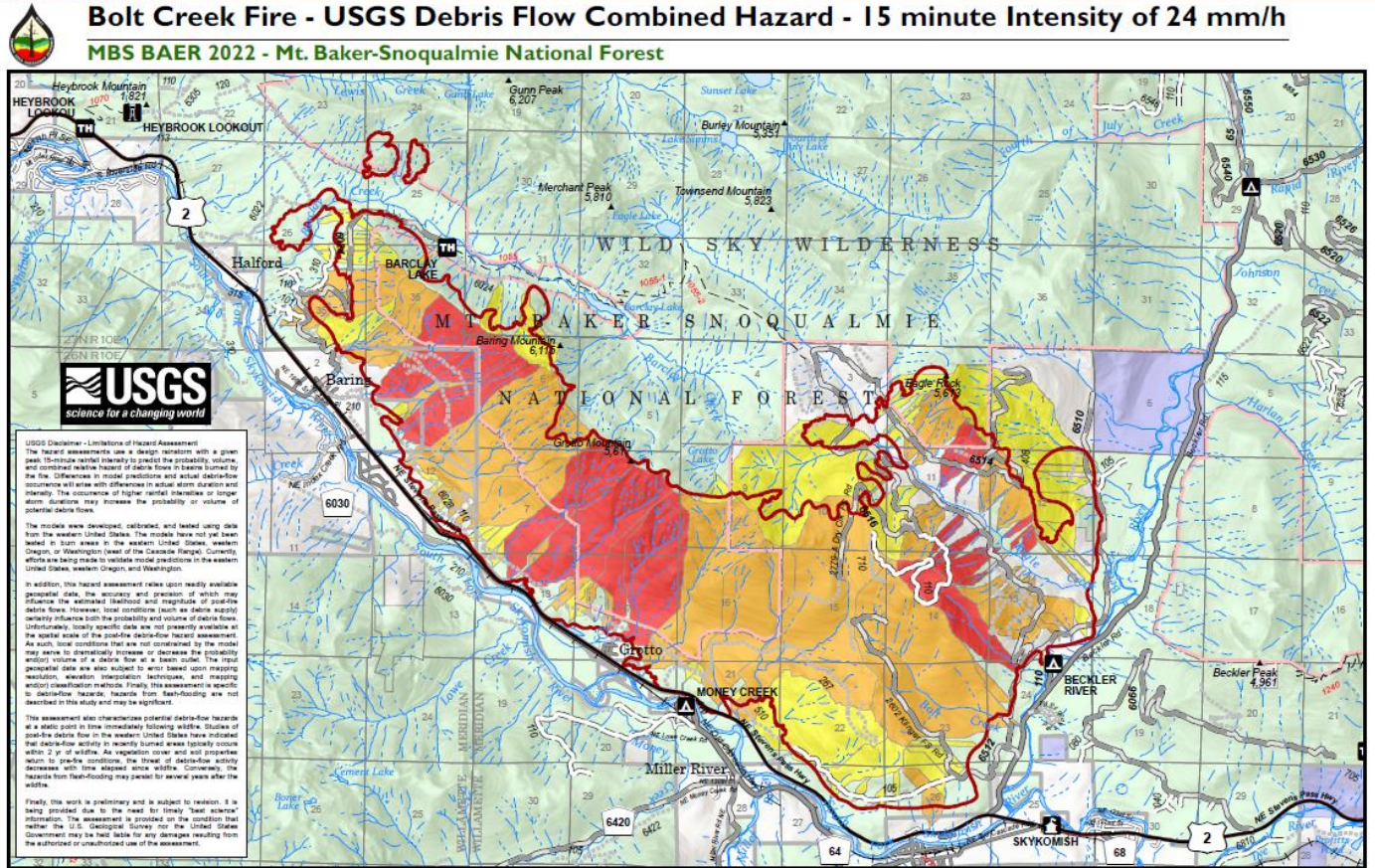
improving the infiltration capacity of the soils. Time for recovery of elevated peak flows to base flow will likely take longer than the vegetative recovery period in this region.

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.



Bolt Creek Fire - USGS Debris Flow Combined Hazard - 15 minute Intensity of 24 mm/h MBS BAER 2022 - Mt. Baker-Snoqualmie National Forest



Disclaimer

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0 1 2 3 4 Miles

Combined Hazard

- Low
- Moderate
- High

Probability and volume combined of a debris flow in response to the design rainstorm with a peak 15-minute rainfall intensity of 24 mm/hour

- Fire Perimeter
- Ranger District Boundary
- FS Wilderness Boundary
- Forest Service Land
- State Lands
- Primary Highway
- Paved Road
- Gravel Road
- Unimproved Roads
- Dirt (Not Paved)
- Closed Roads
- Railroad
- Trail

WASHINGTON
King & Snohomish Counties

Date: 10/3/2022

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 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

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	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. S2 Road barricades and gate on 6414 road
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 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	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
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	Native plant communities and ecosystem functions are very difficult to restore once invasive plants are established.	High	P1b. Invasives EDRR - Suppression	Invasives EDRR - Suppression Minor EDRR work could be included in the normal program of work by the District
BAER critical value	Property - Roads	All non-surveyed ML 2 roads within, or directly adjacent to, the fire and	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	High	Close road, assess road	S12. Close roads administratively until they can be assessed. S2 Road barricades

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
		within or below High and Moderate SBS					into adjacent Drainages			
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. S2 Road barricades
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. S2 Road barricades
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. S2 Install gate
BAER critical value	Property - Roads	FSR 6028 Baring Mountain	Elevated runoff/flooding and dry ravel, tree and rockfall	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	High	Storm proof, storm inspection/response, construct dips to mitigate diversion potential , close road	S12 close road using existing gate. S2 Road barricades

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
			from post fire conditions				tracks/Hwy 2 below. Increased sedimentation into Skykomish River			
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	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	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 - 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

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

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 6: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land	N/A	N/A	N/A
Channel	N/A	N/A	N/A
Roads/Trails	80	80	80
Protection/Safety	90	90	90

E. Cost of No-Action (Including Loss): [REDACTED]

F. Cost of Selected Alternative (Including Loss): [REDACTED]

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

Forest BAER Coordinator: John Kelley
Email: john.kelley@usda.gov **Phone(s):** 760-660-4189

Team Members: Table 7: BAER Team Members by Skill

Skill	Team Member Name
Team Lead(s)	Joe Blanchard
Soils	Ryan Sparhawk
Hydrology	Kacey Largent
Hydrology (t)	Rae Kursky
Engineering	Ken Bigelow
GIS	Dave Keenum
Archaeology	Megan Berryoung
Weeds	Kevin James
Recreation	Brent Freeman
Geologist	Kate Michelson (WA DNR)
PIO	Amy Linn

H. Treatment Narrative:

Land Treatments:**Suppression EDRR:**

Invasive plant treatments associated with suppression repair total 14 acres. Most of these acres are for dozer line and fuel breaks with the remaining related to ground disturbing road repair. Suppression actions did not occur near known infestations however MBS priority weed species can establish in areas of increased sunlight and ground disturbance. Therefore, EDRR for suppression repair is recommended to prevent the introduction and establishment of invasive species. Invasive treatments connected to this incident can be accomplished as part of the MBS program without requiring additional BAER funding.

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. [REDACTED]

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. [REDACTED]

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. [REDACTED]

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. [REDACTED]

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. [REDACTED] cost was added to the cost estimate.

Bolt Creek BAER Assessment Area - USFS Treatment Schedule

Treatment	Unit	Unit Cost	Quantity	Cost Carson
Storm Proof - Clean inlet/Catch Basin/Ditches (Mile) - R1	MILE	████████	█	████████
Drain Dip (Each) R2a-1	EACH	████████	█	████████
Improve Dip (Each) R2a-2	EACH	████████	█	████████
Storm Inspection & Response (Miles) - R3a	MILE	████████	██	████████
Storm Inspection & Response w/ Heavy Equipment - R3b	EACH	████████	█	████████
Treat Un-surveyed portion of FSR 6514*	MILE	████████	██	████████
Remove Infrastructure, Culvert - S8	EACH	████████	█	████████
			████████	████████

*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.

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. ██████████

Bolt Creek BAER Assessment Area - USFS Treatment Schedule

Treatment	Unit	Unit Cost	Quantity	Cost Carson
Warning Sign - S1a	EACH	████████	█	████████
			████████	████████

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.

Signs to notify and warn the public of the hazards		Cost	Amount	\$
Rec site name	Sign number			
Campgrounds	(FW8-14f) 48 X 24 – 4C- INCH LETTERS	█	█	█
Dispersed site on Bolt Creek	(TFW8-14f) 14 X 8 – 1B-INCH LETTERS	█	█	█
Posts/Hardware		█		█
Overtime for coordination and install		█		█
				█

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. █
- A type III barricade was determined to be ineffective at the 6514 road location so a hard closure devise 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 Assessment Area - USFS Treatment Schedule

Treatment	Unit	Unit Cost	Quantity Carson	Cost Carson
Physical Closure Device (Type III Barricade) -S2 (Each)	EACH	█	█	█
				█

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 █

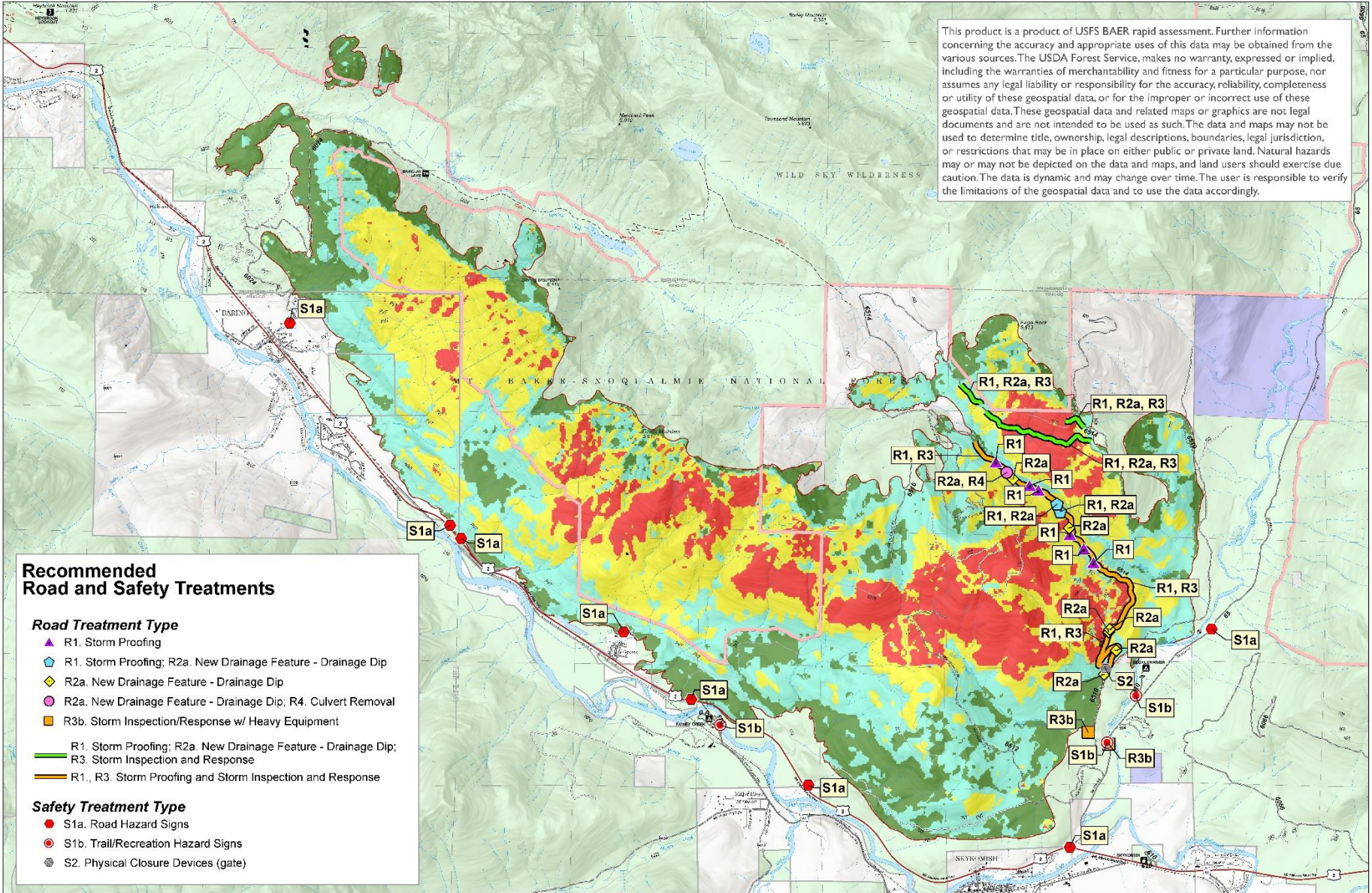
Bolt Creek BAER Assessment Area - USFS Treatment Schedule

Treatment	Unit	Unit Cost	Quantity Carson	Cost Carson
Physical Closure Device (‘Powder River’ Style Gate) -S2b (Each)	EACH	█	█	█
				█



Recommended Treatments - Bolt Creek Fire

MBS BAER 2022 - Mt. Baker-Snoqualmie National Forest



Disclaimer: This map was prepared using the best available data. The user is responsible for verifying the accuracy and completeness of the data. The map is for informational purposes only and does not constitute a warranty or liability of the USDA Forest Service.

- Fire Boundary
- Well
- Drinking Water Source
- Stream Flow Gauging Station
- Building Footprint
- Ranger District Office
- Campground
- Lookout
- Trailhead
- Primary Highway
- Paved Roads
- Gravel Road
- Dirt (Not Paved)
- Unimproved Roads
- Closed Roads
- Trail
- Tunnel, Bridge
- Railroad
- Ranger District Boundary
- FS Wilderness Boundary
- Forest Service Land
- State Land
- Private, Local Government, Undesignated



PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Line Items	Units	Unit Cost	NFS Lands			Other Lands				All Total
			# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	
A. Land Treatments										
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>										
B. Channel Treatments										
<i>Subtotal Channel Treatments</i>										
C. Road and Trails										
R1- Storm Proof	MILE									
R2a-1 Drain Dip	EACH									
R2a-2 Improve Dip	EACH									
R3a- Storm Inspection & Response	MILE									
R3b- Storm Inspection & Response w/ Heavy Equipment	EACH									
FSR 6514 Trt	MILE									
S8- Remove Culvert	EACH									
<i>Subtotal Road and Trails</i>										
D. Protection/Safety										
S1a- Warning Signs	EACH									
S1b- Warning Signs	EACH									
S2a- Road Barricade	EACH									
S2b- Road Gate	EACH									
<i>Subtotal Protection/Safety</i>										
E. BAER Evaluation										
Initial Assessment	Report									
<i>Subtotal Evaluation</i>										
F. Monitoring										
<i>Subtotal Monitoring</i>										
G. Totals										
Previously approved										
Total for this request										

PART VII - APPROVALS

1. _____
 Forest Supervisor Date