USDA-FOREST SERVICE FS-2500-8 (6/06)

Date of Report: 09/22/2018

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[X] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[X] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

[ ] 2. Interim Report #____
[ ] Updating the initial funding request based on more accurate site data or design analysis
[ ] Status of accomplishments to date

[ ] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Miriam

B. Fire Number: WA-OWF-000443

C. State: Washington

D. County: Yakima

E. Region: PNW (R6)

F. Forest: Okanogan-Wenatchee

G. District: Naches

H. Fire Incident Job Code: P6L17M18 (0617)

I. Date Fire Started: 7/30/2018

J. Date Fire Contained: 50% contained as of 09/22/2018

K. Suppression Cost: $ 14,196,784.40 as of 9/22/2018

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): <1 mile (dozer line); 1 mile (hand line)
2. Fireline seeded (miles): 0
3. Other (identify):

M. Watershed Number: 170300020302 North Fork Tieton River watershed

Subwatershed Name	Total Subwatershed Acres (Percent Burned)	Unburned or Very Low Acres	Soil Burn Severity		
			Low Acres	Moderate Acres	High Acres
North Fork Tieton River	5,293 (19%)	1689	2560 (9%)	898 (3%)	146 (1%)

N. Total Acres Burned: 5,293 total acres (as of 9/22/2018)
NFS Acres (5,293) BLM (0) State of Oregon (0) Private (0)

Burn Severity (acres): Total: 1,689 (unburned); 2,560 (low); 898 (moderate); 146 (high)

NFSLand: 1,689 (unburned); 2,560 (low); 898 (moderate); 146 (high)

O. Vegetation Types: The Miriam fire is dominated by a moist western hemlock (*Tsuga heterophylla*)/ western red cedar (*Thuja plicata*) and an understory plant community that is shade tolerant and associated with moist forest such as Oregon grape (*Berberis nervosa*)/twin flower (*Linnae borealis*)/vanilla leaf (*Achylys triphylla*)/wild ginger (*Asarum caudatum*). A variety of springs and slumps created by movement across the slopes have created some small pockets of forested wetlands.

Elevations above 4,500 are dominated by rock and subalpine fir, Engelmann spruce, lodge pole pine, mountain hemlock, whitebark pine and a grouse/low huckleberry low shrub plant communities characteristic of high, cold windswept, and high snow accumulation environments. These cool, moist forest types typically have fire return intervals of 150-400 years. Accumulation of large downed wood also characterized the sites which likely had very little understory vegetation.

P. Dominant Soils: Within the fire perimeter, a majority of the soils are volcanic ash over colluvium derived from andesite. The most common soil group within the burn are Andic Haplocryods (3,163 acres). These soils are highly variable, depth is typically very deep with well drained soils. Soils have a texture of ashy loamy sand to ashy sandy loam.

Q. Geologic Types: The two major geologic types in the fire perimeter was the Russell Ranch Formation and Hogback Mountain mafic rocks. The Russell Ranch formation within the fire perimeter is an elastic subunit consisting mainly of sandstone and mudstone, with minor conglomerate, greenstone and chert. Hogback Mountain mafic rocks are olivine basalt and basaltic andesite rocks created from the eruption of Hogback Mountain, a shield volcano north of Goat Rocks and south of White Pass during the end of the Pliocene through the early Pleistocene. The remaining geologic types are intrusive andesite, alluvium, and landslide deposits from past local activity in the fire area.

R. Miles of Stream Channels by Order or Class:

Stream Type	Miles
Perennial	7
Intermittent	7
Ephemeral	0
Canal/Ditch	0
Grand Total	14

S. Transportation System

Trails: 5 miles (all within Goat Rocks Wilderness); Pacific Crest Trail = 0.5 miles

Roads: Class 3 (Suitable for passenger cars) 2 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): High: 146 acres (3%); Moderate: 898 acres (17%); Low: 2,560 acres (48%); Unburned: 1,689 acres (32%).

B. Water-Repellent Soil (acres): Natural hydrophobicity is present on approximately 88% of soils (4,658 acres) and was found to be highly variable during field verification in unburned, low, and moderate burn severities. Fire-induced or altered hydrophobicity occurred on approximately 12% of soils (100% of severely burned soil and 50% of moderately burned soil), or around 635 acres.

C. Soil Erosion Hazard Rating (acres):
52 ac (1%) (low) 368 ac (7%) (moderate) 3917 ac (74%) (high) 956 ac (18%) (rock/water)

D. Erosion Potential: up to 6.1 tons/acre

E. Sediment Potential: up to 250 cubic yards / square mile

F. Debris Flow Potential: The USGS preliminary debris hazard assessment predicted the likelihood of debris flow (%), potential volume of debris flow (m3), and combined relative debris flow hazard based upon a design storm with a peak 15-minute rainfall intensity of 24 millimeters per hour (mm/h). For the majority of the burn perimeter, the debris flow hazard was rated low to moderate. Three small hillslope basins rated as high debris flow hazard potential, which are up gradient of the FSR 1207 and floodplain of the NF Tieton River.

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 3-5

B. Design Chance of Success, (percent): 75%

C. Equivalent Design Recurrence Interval, (years): 5-year

D. Design Storm Duration, (hours): 1-hour

E. Design Storm Magnitude, (inches): 0.7

F. Design Flow, (cubic feet / second/ square mile): 12.74

G. Estimated Reduction in Infiltration, (percent): 20%

H. Adjusted Design Flow, (cfs per square mile): 60.14

PART V - SUMMARY OF ANALYSIS

The Miriam Fire was detected on July 30th, 2018 at approximately 10:00 a.m. after lightning passed through the

area on July 28th, 2018. The Miriam Fire is located on the Naches Ranger District of the Okanogan-Wenatchee National Forest 32 miles southwest of Naches, Washington. The fire is burning within the Goat Rocks Wilderness. The fire is east of the White Pass Ski Area, south of Highway 12, and west of the Tieton River. The majority of the wildfire burned in the Goat Rocks Wilderness above Forest Road 1207 and to the Southeast of White Pass ski area on the East side of the Pacific Crest Trail (PCT). Along Forest Road 1207 there are dispersed campsites, and Scatter Creek trailhead is located at the end of the road. Forest roads 1207 and 530 are also groomed ski routes in the winter. Scatter Creek Trailhead provides connector trails to the Pacific Crest Trail, a nationally recognized scenic trail that recieves heavy use. The North Fork Tieton River and North Fork Tieton River meadows is occuppied critical habitat for Bull Trout (*Salvelinus confluentus*), a federally threatened fish species.

Field assessments were conducted by BAER team members on September 15th-19th, 2018. The Miriam Fire burned 5,293 acres with approximately 4,805 acres within the Goat Rocks Wilderness. Approximately 3% of the area within the fire perimeter burned at a high soil burn severity (SBS), 17% at moderate, and 48% low soil burn severities. Thirty-two precent (32%) of the Miriam burn perimeter was unburned. The following summarizes the BAER team's emergency determination for the identified critical values. Determinations take into account hydrologic modelling information, predicted soil erosion and debris flow potential, field reconnaissance and observation of post-fire hydrologic response.

Hydrologic Response

The Miriam Fire is entirely within the North Fork Tieton River watershed. Increased watershed response is expected in moderate to high burn severity areas. The primary watershed responses of the Miriam Fire area are expected to include: 1) an initial flush of ash; 2) rill and gully erosion in drainages and on steep slopes within the burned area; 3) flash floods with increased peak flows and sediment deposition; and 4) debris flows. The watershed responses are dependent on the occurrence of storm and melt events and should be greatest with initial storm events. The disturbances will become less evident as vegetation is reestablished, providing ground cover and increasing surface roughness.

The primary hydrologic mechanisms of damage are flooding, debris flows, and debris jams. After a field reconnaissance, the BAER team identified the North Fork Tieton River, Hell Creek, Scatter Creek, and two unnamed tributarites of particular concern. The Soil Burn Severity map and modeling coupled with field observations were used to assess the level of threat and risk to the values at risk in and adjacent to the burned area, and to develop treatment recommendations. The combination of moderate and high severities was used to indicate the hydrologic response because it is these severity ranges that produce the majority of the post-fire runoff.

Soil erosion and subsequent sediment increases are predicted throughout and downstream of the burn area. Sediment increases are expected to occur during a rain event of 0.7 inches. These increases will be of short term duration, recovering to pre-fire conditions over time with the worst impacts occurring over the next three years.

A. Describe Critical Values/Resources and Threats:

Values Assessment:
The table below is Exhibit 02 from FSM 2523.1. This matrix was used to evaluate the risk level for each value identified during this BAER assessment. See FSM 2523.1 for additional information.

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**

The following table is the summary of the critical values that were identified within or immediately adjacent to the Miriam Fire. Potential threats to these values were described, the probability or loss of these values, the magnitude of consequences and the resulting level of risk were identified for each critical value on National Forest System lands.

Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Magnitude of Consequence	Risk	Treatment
Human Life, Safety	Dispersed Camping site at Miriam Creek and Rd 1207	Safety of public from hazard trees, increased debris flow and stream run-off; flooding of dispersed camping sites	**Possible**	**Major**	**High**	**Protection and Safety Treatment: Hazard Signs to inform public of potential threats;**
Human Life, Safety	Backcountry Skiing (from White Pass Ski Resort)	Exposure of general public to hazard trees while recreating in the area.	**Unlikely**	**Major**	**Intermediate**	**Protection and Safety Treatment: Posting hazard signs to inform public of potential threats;**
Human Life, Safety	Hiking Trails Network (Pacific Crest Trail #2000; Nork Fork Tieton #1118; Hidden Springs #117; Scatter Creek)	Exposure of hikers to potential hazard trees along the trail; Compromised trail tread creating unsafe hiking conditions	**Unlikely**	**Major**	**Intermediate**	**Protection and Safety Treatment: Install hazard warning signs**
Human Life, Safety	Camping at Scatter Creek Trailhead	Exposure of recreationists to possible increased debris flow; hazard trees within the area; and flooding	**Possible**	**Moderate**	**Intermediate**	**Protection and Safety Treatment: Install hazard warning signs**
Human Life, Safety	Groomed Ski Routes (FS RD 1207; FS RD 530)	hazard trees falling along the road exposing winter recreationists to hazardous conditions	**Unlikely**	**Major**	**Intermediate**	**Protection and Safety Treatment: Install warning signage along roads**
Human Life, Safety	Dispersed Camping along 1207 Road	Safety of public and employees from hazard trees, increased debris flow and stream run-off; flooding of dispersed camping sites	**Unlikely**	**Moderate**	**Low**	**Low Risk does not warrant treatment**
Human Life, Safety	Group Camps (Zarahemla, Grace Bethren)	Potential risk to recreationists while on the property from increased debris flow; hazard trees.	**Unlikely**	**Moderate**	**Low**	**Low Risk does not warrant treatment**
Human Life, Safety	Clear Lake Forest Service Day Use Area	Potential risk to recreationists while on the property from increased debris flow; hazard trees.	**Unlikely**	**Moderate**	**Low**	**Low Risk does not warrant treatment**
Human Life, Safety	White Pass Ski Resort	General public being exposed to hazard trees, hazardous and unstable terrain.	**Unlikely**	**Minor**	**Very Low**	**Very Low Risk does not warrant treatment**
Property	FSR 1207 road prism (ML3, 1.558 miles below high/moderate burn area)	Elevated runoff and dry ravel from moderate-high SBS burned hillslopes above road.	**Likely**, increased flow and large woody debris in draws and culverts could erode roadway at point of flow	**Major -** Loss of road prism and increased sedimentation into North Fork Tieton Creek, fish critical habitat	**High**	**Storm Proof (1.518 miles), construct 4 armored dips that are below high to moderate burn area.**
Property	Miriam Creek Bridge	potential scour in high flows and potential impact damage from mobilized debris	**Possible:** increased flow and associated debris	**Major:** loss of bridge investment	**High**	**Monitor as part of regular program of work**

Property	Downstream Bridge over North Fork Tieton River	*potential scour in high flows and potential impact damage from mobilized debris*	**Possible:** increased flow and associated debris	**Major:** loss of bridge investment	**High**	**Monitor as part of regular program of work**
Property	Scatter Creek Campground Road @ Trail Bridge over Scatter Creek	High potential scour in high flows and high potential impact damage from mobilized debris on low profile trail bridge	**Very Likely:** increased flow and associated debris	**Major:** loss of bridge investment and campground loop road	**High**	**Install armored dip on east approach of trail bridge**
Property	Hiking Trails Network (Pacific Crest Trail #2000; Nork Fork Tieton #1118; Hidden Springs #117; Scatter Creek)	Loss of tread, soil erosion along the trail, burnt trees in moderate and high severity areas along the trail; hazard trees falling onto the trail	**Likely**	**Moderate**	**High**	**Trail Treatment: mitigate hazards by repairing trail tread along section of trail in Mod/High burn severity; installation of drainage features**
Property	Camping at Scatter Creek Trailhead	Potential increase of hazard trees falling in the area; increased debris flow; raveling in the area.	**Possible**	**Moderate**	**Intermediate**	**Intermediate Risk does not warrant treatment**
Property	FSR 1207674 road prism (ML2, 0.200 miles directly below low burn area)	elevated runoff from burned hillslopes	**Possible**, increased flow and large woody debris could potentially flow down roadway and erode road prism.	**Moderate -** Loss of road prism and increased sedimentation into North Fork Tieton River drainage, fish critical habitat	**Intermediate**	**Intermediate Risk to property does not warrant treatment**
Property	FSR 1207669 road prism (ML2, 0.100 miles directly below low burn area)	elevated runoff from burned hillslopes	**Unlikely**, increased flow and large woody debris could potentially flow down roadway and erode road prism.	**Moderate -** Loss of road prism and increased sedimentation into North Fork Tieton River drainage, fish critical habitat	**Low**	**Low Risk to property does not warrant treatment**
Property	FSR 1207520 road prism (ML2, 0.200 miles directly below low burn area)	elevated runoff from burned hillslopes	**Unlikely**, increased flow and large woody debris could potentially flow down roadway and erode road prism.	**Moderate -** Loss of road prism and increased sedimentation into North Fork Tieton River drainage, fish critical habitat	**Low**	**Low Risk to property does not warrant treatment**
Property	FSR 1200530 road prism (ML 2, 0.183 miles in low/moderate burn area)	elevated runoff in ephemeral, intermittent, and perennial streams overtopping roadway prism	**Unlikely**, increased flow and large woody debris could potentially flow down roadway and erode road prism.	**Moderate** - Loss of access to the Indian Spring/Round Mountain Trailhead and loss of road prism with increased sedimentation into North Fork Tieton River drainage, fish critical habitat	**Low**	**To be determined**

Property	FSR 1207518 road prism (ML 2, 0.200 miles in low/moderate burn area)	elevated runoff in ephemeral, intermittent, and perennial streams overtopping roadway prism	**Unlikely**, increased flow and large woody debris could potentially flow down roadway and erode road prism.	**Moderate** - Loss of road prism with increased sedimentation into North Fork Tieton River drainage, fish critical habitat	**Low**	**To be determined**
Property	White Pass Ski Resort	Exposure of property to hazard trees, potential debris flow and increased run-off potential	**Unlikely**	**Minor**	**Very Low**	**Very Low Risk does not warrant treatment**
Property	Clear Lake Forest Service Day Use Area	Potential for properties to be exposed to increased sediment and debris flow from Clear Lake. Run-off and sediment.	**Unlikely**	**Minor**	**Very Low**	**Very Low Risk does not warrant treatment**
Property	Groomed Ski Routes (FS RD 1207; FS RD 530)	Increased hazard trees falling onto or along the road	**Unlikely**	**Minor**	**Very Low**	**Very Low Risk does not warrant treatment**
Natural Resource	Native Vegetation Recovery and Function	Loss of native vegetation; noxious weed infestation to areas not previous colonized by non-native noxious plants	**Likely**	**Major**	**Very High**	**Land Treatment: Early Detection Rapid Response**
Natural Resource	White Bark Pine (candidate species)	Not fire tolerant species; mortality from moderate burn; changes in soil productivity resulting in decreased survival	**Unlikely**	**Major**	**Intermediate**	**Intermediate Risk to resource does not warrant treatment**
Natural Resource	Wetland Communities	Risk of the slope failing, changing hydrology in wetland areas, changing remaining vegetation diversity	**Unlikely**	**Major**	**Intermediate**	**Intermediate Risk to resource does not warrant treatment**
Natural Resource	Soil Productivity	Potential for increased debris flow; increased volcanic ash; overland flow and gullies; increased soil erosion	**Likely**	**Minor**	**Low**	**Low Risk to resource does not warrant treatment**
Natural Resource	Watershed - Hydrologic Function	Increased runoff and sediment deposition	**Likely**	**Minor**	**Low**	**Low Risk to resource does not warrant treatment**
Natural Resource	Bull Trout critical habitat - NorthFork Tieton River and unnamed tributary	Loss of Critical Habitat due to excess sedimentation and debris flow; increase turbidity and duration and magnitude of sediment load.	**Unlikely**	**Minor**	**Low**	**Low Risk to resource does not warrant treatment**
Natural Resource	Watershed - Municipal Water use	Increased runoff and sediment deposition ; Decrease availability of water use for public consumption	**Unlikely**	**Minor**	**Very Low**	**Very Low Risk to resource does not warrant treatment**
Natural Resource	Clear Lake	Decreased capacity ; decrease water quality; increased sedimentation and debris flow; threat to downstream dam between Clear Lake and Rimrock Lake	**Unlikely**	**Minor**	**Very Low**	**Very Low Risk to resource does not warrant treatment**
Cultural Resource	Cultural and Heritage Resources Sites	Loss of scientific data present at archaeological sites due to erosion and looting	**Unlikely**	**Moderate**	**Low**	**Intermediate Risk to resource does not warrant treatment**
Cultural Resource	Cultural and Heritage Resources Sites	Loss of scientific data present at archaeological sites due to site disturbance	**Unlikely**	**Moderate**	**Low**	**Low Risk to resource does not warrant treatment**

Human Life and Safety
The Miriam Fire is surrounded by the greater Naches and Yakima communities who use National Forest System lands for a variety of uses such as recreation, hunting and fuelwood products gathering. Interstate 12 is heavily used as a travel corridor to winter skiing opportunities along the Interstate 90 corridor. The post-fire environment within the Miriam Fire include increased threats to public safety as a result of potential hazard trees, increased debris flow and potential run-off. Threats to human life and safety exist along Forest Roads 1207 and 530, along the Pacific Crest Trail, and at various trailheads, dispersed campsites and day use areas. Mitigation of danger trees along FS Road 1207 and 530 occurred during fire supression efforts. However, it is anticipated that trees may continue to fall during the winter of 2018-2019. Additionally, hazards may still exist along trails, especially within the Goat Rocks Wilderness.

Property
The Miriam Fire has 2 miles of National Forest System roads (FSR) and 5 miles of National Forest System trails within the burn perimeter. All 5 miles of trails occurs within the Goat Rocks Wilderness and approximately 0.5 miles is designated as Pacific Crest Trail, a nationally designated scenic trail. Post-fire conditions include the increase in hazard trees along trails, at trailheads, dispersed campsites and day use areas. Post-fire conditions along roads include increased sediment and debris flow, increased winter runoff into transportation drainage features. Within the Miriam Fire, there are several transportation and recreation investments (bridges, culverts, trailheads) that can be compromised if there is significant runoff events, diverting water, damaging road prisms, destroying tread along trails and eroding campsites.

Natural and Cultural Resources
The Miriam Fire includes pristine wilderness vegetation communities within the Goat Rocks Wilderness, unique habitats such as freshwater emmergent wetlands and mature forests, and habitat for unique fauna and flora species including the federally threatened bull trout, federal candidate white bark pine, and the federally threatened northern spotted owl. Higher elevation habitat include unique subalpine forests. The North Fork Tieton River provides federally designated critical habitat for Bull Trout, and various creeks (Miriam, Hells) all drain into the North Fork Tieton River which feeds Clear and Rimrock Lakes. These resources provide important ecological values for plant, wildlife and human use. Natural resources within the Miriam Fire are at risk from elevated watershed responses, and the introduction of non-native noxious weeds into areas not previously infested. Non-native noxious weed infestation reduces the diversity and resilency of native communities for both flora and fauna. Altered ecological systems can contribute to changes in vegetation communities, altering fire regime and decreased ecological resilency. Reduced water quality, increased soil erosion and decrease ecological function can result. All of these changes can have considerable effects on wilderness characteristics of the Goat Rocks Wilderness.

The surrounding landscape is also important for cultural properties and Native American sacred sites on National Forest System lands. The Miriam Fire area is attributed to the Cowlitz Klickitat Band of the Yakima Indian Nation and the area has been used by native people for at least 10,000 years. The area continues to be used today by all people for the various botanial resources available (i.e., huckleberry, mushrooms, cedar), as well as the biological resources available (i.e, hunting and fishing opportunities). Currently known cultural resources are not at risk to the post-fire threats. However, unknown or unrecorded cutural resources can become exposed as a result of post-fire events.

B. Emergency Treatment Objectives:

The primary objective of the Burned Area Emergency Response report is to recommend reasonable and necessary actions to protect, reduce and minimize threats to human life, safety, property, and to prevent unacceptable loss to cultural and natural resources on National Forest System lands from “imminent post-wildfire threats” (FSM 2523.02). The timely application of the proposed treatments is expected to substantially reduce the probability of damage to the BAER critical values identified in the section above. Recommended emergency treatment objectives include the following:

Land Treatments (**L1a, L2b**).

1. Promote the recovery of native plant communities in the burned area by minimizing the spread of non-native noxious weeds.

Channel Treatments

1. No channel treatments proposed

Road and Trail Treatments (RT1, RT3, RT10)

1. Protect road and trail investments from potential infrastructure damage due to elevated post-fire runoff.
2. Reduce potential sediment delivery into the North Fork Tieton River degrading water quality into Clear and Rimrock Lakes and critical habitat for the Bull Trout.

Protection and Safety Treatments (P1)

1. Protect human life and safety of recreationists by increasing awareness of post-fire hazards. Installation of warning signs along trails, at trailheads, dispersed campsites and at White Pass Ski resort immediately adacent to the burned area.
2. Protect human life and safety from post-fire hazards through coordination with partners, and other federal, state, county and local jurisdictions.
3. Minimize hazards to employees by mitigating hazard trees at specific locations where trail/road treatments are occuring.

Monitoring and Coordination Treatments

1. Facilitate communication between cooperating agencies, White Pass Ski resort, Pacific Crest Trail Association, recreational residences, and organizational camps to increase awareness of post-fire environment (i.e., hazard trees)
2. Monitor the effectiveness of road and trail treatments and facilitate any needed maintenance of treatments during the first year following the fire.

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

Land **80** % Channel **na** % Roads/Trails **90** % Protection/Safety **90** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	80	90
Channel	na	na	na
Roads	85	90	95
Trails	75	75	75
Protection/Safety	90-100	90-100	90-100

E. Cost of No-Action (Including Loss): $1,147,160 (cost of replacement of road/trail infrastructure)

Implied Minimum Value (IMV) is a method for determining the cost:benefit ratio for values at risk when current market values are not available (USDA 2007). Refer to https://www.fs.fed.us/rm/pubs/rmrs_gtr205.pdf

Human Life and Safety: The significance of protecting human life and safety is assumed to be self evident. The cost of human life is not included as a part of the cost to justify the land, roads/trail and protection/safety treatments. Foregoing the installation of warning signs would expose the general public, as well as employees to hazards without their knowledge. Hazards include: falling trees, unstable trail tread and increased run-off potential.

Property: Portions of Forest Service roads have been identified as having increased potential for debris flow, increased run-off and sediment delivery. Based on the Miriam BAER Hydrology Resource Report findings, stream flow in the smaller drainages will be dramatically greater in the post fire environment. As a consequence, portions of the road network and related infrastructure may be compromised. No Forest Roads are in the High/Moderate Burn Severity. However sections of road below High/Moderate Burn Severity are still susceptible to runoff from post fire conditions whether they are inside or outside the fire perimeter. Appendix 2 of the Engineering Roads reports indicate that the value of loss of road property infrastructure is $1,094,160.00. Forest Service trails are of high economical and social value to the surrounding area. Portions of various trails burned in moderate/high burn severity, which will result in increased tread loss and dry ravel.The total trail infrastructure within the fire perimeter is valued at more than $53,000 (miles of trail in moderate and high severity burn are valued at $16,000).The implied minimum value is: $ 37,854.06.

IMPLIED MINIMUM VALUE	
Estimated cost of treatment:	$22,211.20 + $10,950
Estimated Prob of Damage or Loss w/o treatment:	90%
Estimated Prob of Damage or Loss if treated:	20%
IMV: Treatment Cost/ (Probability Loss untreated - Loss treated)	
Implied Minium Value for property: $33,161.20 / (.9-.2) =	$ 37,854.06

Natural Resource:
Without rapid treatment to minimize the infestation of known non-native noxious weeds into the burn perimeter, there is a likely risk of decreased native ecosystem recovery. Wilderness characteristics relative to the pristine and primative state of the Goat Rocks Wilderness will be compromised. Natural ecosystem process continue to diminish with the increased spread of noxious weeds. The implied minimum value is: $14,980.

IMPLIED MINIMUM VALUE	
Estimated cost of treatment:	$10,486
Estimated Prob of Damage or Loss w/o treatment:	90%
Estimated Prob of Damage or Loss if treated:	20%
IMV: Treatment Cost/ (Probability Loss untreated - Loss treated)	
Implied Minium Value for property: $10,486 / (.9-.2) =	$ 14,980

F. Cost of Selected Alternative (Including Loss): $ 49,797

G. Skills Represented on Burned-Area Survey Team:

Hydrology: Leah Shipstead, Joe Krenzelok (t)
Soils: Mary Young, Lynn Khuat (t), Pauline Adams (t)
Engineering: Ken Bigelow, Lori McAllister
Trails/Recreation: Angela McPhee
Botany: Helen Lau
Archaeology: Dorit Buckley
Fisheries: JD Jones
GIS: Dorothy Thomas, Upekela (Pek) Wijayratne (t)

Team Leader: Anne Poopatanapong

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H. **Treatment Narrative:**

Land Treatments: **L1 and L2 Early Detection/Rapid Response of Invasive Weeds**

Early Detection Rapid Response (EDRR) treatment is proposed based on proximity to known plant infestations and sensitive habitat that are most susceptible to alterations by invasive plant species. Treatments are critical to prevent non-native noxious weeds from producing seeds and establishing within the Miriam Burn. EDRR will occur at specific handlines, dozer lines and drop points. Rapid response will include manual removal and/or other treatment options currently covered under existing NEPA documents. Implementation will begin in the fall of 2019 and occur through the spring of 2019. Effectiveness monitoring will continue in 2019.

EDRR of 5.29 miles trails and 6.3 miles (75 ac) completed dozer line. 10 days; 2 person crew @400/day; 3 days District Botanist @ 331/day; supplies	$4,912.00
(1,110 ac) EDRR of wilderness 10 days; 2 person crew @ 400/day; 4 days District Botanist @ 331/day; supplies	$5,574.00
Total	**$10,486.00**

Channel Treatments:

No channel treatments are proposed.

Roads and Trail Treatments: **R1 Storm Proofing, Inspection and Response**

The roads proposed for treatment are vital to the Forest for Public and Administration access in addition to resource protection. Treatments will minimize damage to the road surface and template by hardening road surface and diverting water off the road at intermittent channel crossings and at strategic locations in order to minimize fill-slope deterioration. Treatment(s) will vary from cleaning burnt debris and fallen rocks out of ditches and culvert inlets to constructing strategically placed armored rolling dips. No storm proofing was called for at sites where an armored dip was proposed as a treatment. See the Engineering Roads report for detail description of treatment type and location.

Road #	ML	Treated Mileage (Below Moderate/High Burn)	$ 3,400.00 Storm Proofing (Mile)	$ 3,410.00 Armored Dip - Type IV (EA)	TOTAL COST	NOTES
1207000	3	1.558	1.518	4.000	**$ 18,801.20**	CONSTRUCT 4 ARMORED DIPS, STORM PROOFING INCLUDES TWO TREATMENTS (ONE IN THE SPRING AND ONE DURING A HEAVY STORM EVENT)
1207674	2	0.000	0.000	0.000	$ -	NO TREATMENT
1207669	2	0.000	0.000	0.000	$ -	NO TREATMENT
1207520	2	0.000	0.000	0.000	$ -	NO TREATMENT
1207518	2	0.000	0.000	0.000	$ -	ROAD NOT SURVEYED. ROAD IS SOUL ACCESS INTO ROUND MOUNTAIN/INDIAN SPRINGS TRAILHEAD. SURVEY ROAD FOR FURTHER ASSESSMENT.
1200530	2	0.000	0.000	0.000	$ -	ROAD NOT SURVEYED, SURVEY ROAD FOR FURTHER ASSESSMENT
Scatter Creek CG Loop Road	3	0.250	0.000	1.000	**$ 3,410.00**	CONSTRUCT ARMORED DIP AT EAST TRAIL BRIDGE APPROACH
Miriam Creek Bridge					**$ 1,000.00**	*MONITOR AS PART OF REGULAR PROGRAM OF WORK
Downstream Bridge					**$ 1,000.00**	*MONITOR AS PART OF REGULAR PROGRAM OF WORK
				TOTALS =	**$ 24,211.20**	* = cost will not be included in BAER funding request.

Roads and Trail Treatments: **RT10 Trail Stabilization**

The wildfire resulted in high and moderate burn severity soils along portions of trail systems, exposing them to erosion hazards. In these areas, the BAER proposal is to stabilize trails by construction of drainage structures and tread stabilization. Treatment would stabilize the trail to protect the trail infrastructure and minimize soil erosion. This treatment would protect the trail infrastructure and minimize soil erosion. Without more drainage structures and tread repair, there is *high risk* that trails will fail as water travels down them.

1.6 miles of trail stabilization for mod/high severity burn, 73 drainage structures and ¼ mile tread repair, imminent hazard tree mitigation where work is to occur.	**$10,950**

Protection/Safety Treatments: **P1 Warning Signs**

To inform general recreationists, discuss findings with local partners (White Pass Ski Resort, Pacific Crest Trail Association). Districts employees will install warning and/or closure signs to help ensure public safety. Post warning signs for snags from recent fire activity. Warning signs will be posed in key access location, at trailheads, and along dispersed campground locations.

Sign installation - 2 employees for 7 days@250/day	$3,500
Write/Post closure and/or warning signs - 2 employees for 3 days@250/day	$1,500
Vehicle one month	$400
Total	**$ 5,400.00**

Interagency Coordination:
Communicate with non-Forest Service partners and special uses permittees (*e.g.,* White Pass Ski resort, Pacfiic Crest Trail Association, National Weather Service, Bureau of Reclammation, Natural Resources Conservation District etc.) that have infrastructure in the fire perimter. * = Cost will not be included in BAER funding request, and will be covered with forest staff.

GS-11 Special Uses staff	3 Days @350/day	$ 1050*
Total Cost		$ 1050*

I. **Monitoring Narrative:**
(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Treatment monitoring will occur as part of the treatment for noxious weeds, roads and trail treatments. No additional funding is requested specifically for monitoring.

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Part VI – Emergency Stabilization Treatments and Source of Funds Interim

Line Items	Units	Unit Cost	# of Units	BAER $	Other $		# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments											
L1a EDRR	each	4912	1	$4,912	$0			$0		$0	$4,912
L1b EDRR	each	5574	1	$5,574	$0			$0		$0	$5,574
				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Land Treatments				$10,486	$0			$0		$0	$10,486
B. Channel Treatments											
none				$0	$0			$0		$0	$0
				$0	$0			$0		$0	$0
				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Channel Treat.				$0	$0			$0		$0	$0
C. Road and Trails											
RT1 road t	each	22211	1	$22,211	$0		1	$2,000		$0	$24,211
RT10 trail	each	10950	1	$10,950	$0			$0		$0	$10,950
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Road & Trails				$33,161	$0			$2,000		$0	$35,161
D. Protection/Safety											
P1 Warnin	each	5400	1	$5,400	$0			$0		$0	$5,400
Interagency Coordination				$0	$0		1	$1,050		$0	$1,050
				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Structures				$5,400	$0			$1,050		$0	$6,450
E. BAER Evaluation											
evaluation	each	47820	1	---	$47,820			$0		$0	$47,820
Trainees cost					$20,691						$20,691
Insert new items above this line!				---	$0			$0		$0	$0
Subtotal Evaluation				---	$68,511			$0		$0	$68,511
F. Monitoring											
none				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Monitoring				$0	$0			$0		$0	$0
G. Totals				$49,047	$68,511			**$3,050**		**$0**	**$52,097**
approved											
his request				**$49,047**							

PART VII - APPROVALS

1. _____ _____
Forest Supervisor (signature) Date

2. Regional Forester (signature) 10/4/2018
Date