

**Date of Report: October 18, 2022****BURNED-AREA REPORT**

MOOSE FIRE 2022  
and  
OWL FIRE 2022

SALMON-CHALLIS NATIONAL FOREST



*Moose Fire photos from inciweb (Top left 7/24/22, Top right 7/25/22, Bottom left 9/7/22, Bottom right 9/16/22)*

**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:** Moose Fire  
Owl Fire

**B. Fire Number:** ID-SCF-022105  
ID-SCF-022248

**C. State:** Idaho

**D. County:** Lemhi

**E. Region:** 4 (Intermountain)

**F. Forest:** Salmon-Challis NF

**G. District:** North Fork, Salmon-Cobalt

**H. Fire Incident Job Code:** P4PVZ5 (0413)

**I. Date Fire Started:** Moose Fire: July 17, 2022  
Owl Fire: Sept 8, 2022

**J. Date Fire Contained:** *estimated* Oct 31, 2022

**K. Suppression Cost:** \$ 125,000,000 (*est. final cost*)

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

1. **Fireline repaired (miles):** *See table below*
2. **Other (identify):** *See table below*

*Fire line status for the Moose Fire, as of 10/3/2022. Fire suppression repair is in progress.*

	Completed - Inspected	Completed - Ready for Inspection	In Progress	In Use - Fire Management	Needs Assessment	No Repair Needed	Other - See Comments	Repair Needed	(blank)	Total
Access or Improved Road	0.33		11.12	8.38	0.16	8.31		3.22		<b>31.51</b>
Completed Dozer Line	9.77	0.07	0.40	0.99				3.61		<b>14.85</b>
Completed Fuel Break	1.61			0.29						<b>1.90</b>
Completed Hand Line	20.88	0.21	0.50			4.62	0.16	0.73	0.03	<b>27.12</b>
Completed Mixed Construction Line	9.22		16.99	0.00	0.74	19.49		3.52		<b>49.96</b>
Completed Plow Line	0.13									<b>0.13</b>
Completed Road as Line	52.15		22.59	0.92		8.68		1.89		<b>86.24</b>
Repair Line	0.27									<b>0.27</b>
<b>Total</b>	<b>94.37</b>	<b>0.28</b>	<b>51.59</b>	<b>10.60</b>	<b>0.89</b>	<b>41.10</b>	<b>0.16</b>	<b>12.96</b>	<b>0.03</b>	<b>211.99</b>

**M. Watershed Numbers:**

**MOOSE FIRE**

*Table 1: Acres Burned by Watershed*

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170602030702	Moose Creek	25359	25372	100%
170602030803	Pine Creek	18967	18974	100%
170602031202	Beaver Creek	11527	11288	98%
170602030705	East Boulder Creek-Salmon River	19304	15467	80%
170602030701	Dump Creek-Salmon River	18264	14159	78%
170602031002	Arnett Creek	12059	7634	63%
170602031001	Upper Napias Creek	14055	8214	58%
170602030504	Wallace Creek-Salmon River	24714	11116	45%
170602030507	Wagonhammer Creek-Salmon River	25529	9463	37%
170602030802	Boulder Creek-Salmon River	21570	7375	34%
170602031204	Garden Creek-Panther Creek	16646	4835	29%
170602030804	Big Sheepeater Creek-Salmon River	12562	3200	25%
170602030404	Fenster Creek-Salmon River	20521	2411	12%
170602030402	Jesse Creek	12908	958	7%
170602031201	Trail Creek-Panther Creek	23294	1295	6%
170602030703	Indian Creek	34634	5	0.02%

**OWL FIRE**

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170602031301	Owl Creek	34427	720	2%
170602031302	Cove Creek-Salmon River	12098	28	0.2%

**N. Total Acres Burned:**

*Table 2: Total Acres Burned by Ownership*

OWNERSHIP	MOOSE FIRE ACRES	OWL FIRE ACRES
NFS	138,619	747
BLM	1871	0
STATE	0	0
PRIVATE	1276	0
<b>TOTAL</b>	<b>141,766*</b>	<b>747</b>

\* Note that Inciweb reported the Moose Fire burned acres as 130,144 as of 10/18/2022. The BARC burn boundary incorporates a greater area of unburned within the fire perimeter.

**O. Vegetation Types:** Approximately 83% (Moose Fire) and 75% (Owl Fire) of the burned area consists of forested cover types, with the dominant tree species being Douglas Fir. Lodgepole Pine and spruce/fir exist in the higher elevations of the Moose Fire. The majority of the Moose Fire burned in heavily timbered uplands that have not experienced fire in many decades. The lower elevation periphery of the Moose Fire (along the Salmon River and Panther Creek) and much of the Owl Fire burned within non-forested and sparsely forested cover types of bunchgrass and sagebrush. Within the Salmon River breaks, the south-facing aspects of the Owl Fire have a larger percentage of non-forested area, while the Moose Fire within the Salmon River breaks burned primarily on more forested north-facing slopes. The Western portion of the Moose Fire burned within the fire scar of the 2000 Clear Creek Fire, while the entire Owl Fire burned within the fire scar of the 2012 Mustang Complex Fire.

COVER TYPE	MOOSE FIRE		OWL FIRE	
	ACRES	PERCENT	ACRES	PERCENT
Douglas-fir	44380	31.3%	292	39.1%
Lodgepole Pine	43412	30.6%	43	5.8%
Ponderosa Pine	14764	10.4%	223	29.9%

Spruce/Fir	12089	8.5%		
Bunchgrass/Fescue	10941	7.7%	188	25.2%
Grass/Forb	2547	1.8%		
Mountain Big Sage	2122	1.5%		
Dry Shrub/Bunchgrass	2004	1.4%		
Barren	2001	1.4%		
Bunchgrass	1858	1.3%		
Conifer/Mountain Big Sage	1817	1.3%		
Wyoming Big Sage	1211	0.9%		
Mountain Mahogany	488	0.3%		
Threetip Sage	482	0.3%		
Conifer/Fescue	304	0.2%		
OTHER COVER TYPES	1346	0.9%	0.4	0.1%
<b>TOTAL</b>	<b>141,766</b>		<b>747</b>	

**O. Dominant Soils:** Soils in the burned area are described based on Landtypes shown in the table below.

LT	LANDTYPE DESCRIPTION	MOOSE FIRE		OWL FIRE	
		ACRES	PERCENT	ACRES	PERCENT
G109j	Moderately dissected cryic basinland in granite, moist sites	13822	9.9%		
Q120b	Moderately dissected mountain slopelands in quartzite, cool and moist sites	7483	5.3%		
G124R	Rocky steep canyonlands in granite, hot and dry sites	6523	4.7%		
G109j-1	Strongly dissected cryic basinland in granite, moist sites	6090	4.4%		
Q109j	Moderately dissected cryic basinland in quartzite, moist sites	5375	3.8%		
Q109b	Moderately dissected cryic mountain slopeland in quartzite, moist sites	5139	3.7%		
Q109	Cryic ridgelands in quartzite, moist sites	4809	3.4%		
Q120a	Weakly dissected mountain slopeland in quartzite, cool and moist sites	4564	3.3%		
G124n	Timbered steep canyonlands in granite and border zone, cool and moist sites	4501	3.2%		
Q120bs-1	Moderately dissected mountain slopeland in quartzite, warm and dry sites	4403	3.1%		
G120bs-1	Moderately dissected mountain slopelands in granite and border zone, warm and dry sites	3981	2.8%	254	34.0%
Q111a	Weakly dissected glacial troughlands in quartzite, moist sites	3968	2.8%		
G120b	Moderately dissected mountain slopelands in granite and border zone, cool and moist sites	3937	2.8%	300	40.2%
G124s	Steep canyonland in granite and border zone, hot and dry sites	3814	2.7%		
Q124R	Rocky steep canyonlands, hot and dry sites	3717	2.7%		
G120d	Steep timbered headlands in granite, cold and moist sites	3638	2.6%		
G120dR	Steep-rocky headlands in granite and border zone, cold sites	3367	2.4%		
G109b	Moderately dissected cryic mountain slopes in granites and border zone, moist sites	3233	2.3%		
Q120c	Strongly dissected mountain slopeland in quartzite, cool and moist sites	3215	2.3%		
Q120d	Steep timbered headlands, moist to wet sites	2933	2.1%		
Q120bn	Moderately dissected mountain slopelands in quartzite, cold and moist sites	2855	2.0%		
Q110x	Cirque basinlands in quartzite, moist to wet sites with no lakes	2787	2.0%		
Q109a	Weakly dissected cryic mountain slopeland in quartzite, moist sites	2742	2.0%		
Q120cs	Strongly dissected mountain slopeland in quartzite, hot and dry sites	2525	1.8%		
Q124s	Steep canyonland in quartzite, hot and dry sites	2233	1.6%		
G120cs-1	Strongly dissected mountain slopelands in granite and border zone, warm and dry sites	2209	1.6%		
VB	Alluvial valley bottoms including alluvial fans, terraces, and floodplains	1996	1.4%	174	23.3%
G109d	Cryic headlands in granite and border zone, moist sites	1865	1.3%		
Q120bs	Moderately dissected mountain slopelands in quartzite	1648	1.2%		

Q109d	Cryic headlands in quartzite, moist to wet sites	1637	1.2%		
Q120as	Weakly dissected mountain slopeland in quartzite, hot and dry sites	1513	1.1%		
Q120cs-1	Strongly dissected mountain slopeland in quartzite, warm and dry sites	1466	1.0%		
Q124n	Timbered steep canyonlands in quartzite	1193	0.9%		
G120a	Weakly dissected mountain slopelands in granite and border zone, cool and moist sites	1126	0.8%	19	2.5%
Q111aR	Rocky weakly dissected glacial troughlands in quartzite	1076	0.8%		
Q110d	Steep rocky cirque headwall in quartzite	1038	0.7%		
Q120an	Weakly dissected mountain slopeland in quartzite, cold and moist sites	912	0.7%		
Q120dR	Steep rocky headlands	898	0.6%		
Q111d	Steep rocky glaciated headlands in quartzite	851	0.6%		
G120c	Strongly dissected mountain slopelands in granite and border zone, cool and moist sites	819	0.6%		
	OTHER COVER TYPES (0.5% of burned area or less)	7993	5.7%		
	BLM Land – No landtypes available	1871	1.3%		
	<b>TOTAL</b>	<b>141,766</b>		<b>747</b>	

**P. Geologic Types:** Geologic types in the burned area are defined by Landtype Geology.

	MOOSE FIRE		OWL FIRE	
	ACRES	PERCENT	ACRES	PERCENT
Quartzite Landtypes	73883	53%	0	0%
Granitic Landtypes	62077	44%	573	77%
Alluvial Landtypes	1996	1%	174	23%
Volcanic Landtypes	1939	1%	0	0%

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

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MOOSE FIRE	OWL FIRE
PERENNIAL	207.5 (includes 7.9 miles of the Salmon River)	1.9
INTERMITTENT/EPHEMERAL	271.9	0.8
OTHER (DEFINE)	0	0

**R. Transportation System:**

TRAILS	MOOSE FIRE		OWL FIRE	
	National Forest	Other	National Forest	Other
Motorized Trails	25.4	0	0	0
Snow Trails	10.6	0	0	0
Non-motorized Trails	49.8	0	0.9	0

ROADS	MOOSE FIRE		OWL FIRE	
	National Forest	Other (BLM)	National Forest	Other
Open Roads	201.9	1.6	0	0
Closed roads	86.5	0	4.1	0
Unauthorized Routes	149.9	0	0.4	0

### **PART III - WATERSHED CONDITION**

#### **A. Burn Severity (acres):**

**BARC Model:** The BAER Team used BARC (Burned Area Reflectance Classification) data derived from the Forest Service Geospatial Technology and Applications Center, BAER Imagery Support Program as a basis for analyzing burn intensity (vegetative scorch) and soil burn severity (fire impacts to the soil).

Two BARC datasets were obtained over the course of the fire:

- 1) The first BARC dataset was derived from a comparison of Sentinel-2B satellite imagery on 8/21/2022 with pre-fire Sentinel-2B satellite imagery from 7/12/2022. At that time, the Moose Fire had burned 95,542 acres.

The original classification thresholds of the BARC model are as follows:

**Unburned 0-79, Low 80-136, Moderate 137-211, High 212+**

This BARC dataset was utilized during several field verification site visits between 8/16/2022 and 9/23/2022, although this did not cover the portion of the fire burned after 8/21/2022.

- 2) The second BARC dataset was derived from a comparison of Landsat 9 OLI-2 satellite imagery on 9/19/2022 with pre-fire Landsat 8 OLI satellite imagery from 9/24/2021. At that time, the Moose Fire had burned 141,702 acres with little additional growth expected, and this imagery also included the nearby 747-acre Owl Fire.

The original classification thresholds of the BARC model are as follows:

**Unburned 0-62, Low 63-117, Moderate 118-221, High 222+**

This BARC dataset was used to analyze burn intensity and severity because it covered the entire burned area. Using the original thresholds, the second BARC dataset was comparable to the first BARC dataset within the 95,542 acres burned as of 8/21/2022. A small amount (260 acres) of cloud cover existed within the second BARC dataset.

**Burn Intensity:** BARC data verification of burn intensity (defined as vegetative scorch) was conducted by the BAER Team during several field visits to the Salmon River Road, Sage Creek Road, Diamond Creek Road, Pine Creek headwaters, Stormy Peak Road, Ridge Road, Wallace Lake, and Moose Creek Road areas between 8/16/2022 and 9/23/2022. While the first BARC map was used as a reference during these site visits, the field verification information was ultimately applied to the second BARC dataset. It was determined that the BARC had underestimated the amount of moderate and high burn intensity. Classification values of the BARC256 dataset were adjusted to better match observations made during field verification.

The adjusted classification thresholds are as follows:

**Unburned 0-62, Low 63-109, Moderate 110-199, High 200+**

In addition, the 260-acre area of cloud cover within the 9/19/2022 BARC dataset was removed and replaced with the BARC data from the 8/21/2022 dataset, using the original classification thresholds for that dataset. Burn intensity in this small area (representing 0.2% of the fire) was not field verified.

**Soil Burn Severity:** Soil burn severity sampling was conducted during several field visits between 8/25/2022 and 9/15/2022 to establish a relationship between burn intensity as shown in the BARC model and the effects of the fire on the soil (burn severity). The BAER Team determined that high soil burn severity occurred in areas of high burn intensity within lodgepole pine and spruce/fir cover types. High burn intensity within other cover types generally resulted in only moderate soil burn severity, although small, isolated areas of high severity occurred where prolonged smoldering occurred on the ground. Therefore, the BARC classification thresholds were not changed, but the following assumptions were made and applied to the soil burn severity model.

- All high intensity within lodgepole and spruce/fir cover types is high severity.
- All high intensity within any other cover type is changed to moderate severity.
- All moderate intensity is moderate severity.
- All low intensity is low severity.
- The model does not show small, isolated areas of high severity.

The following shows some typical examples of each intensity/severity class observed:

High Intensity/High Severity

Along the Ridge Road above Wallace Lake, in Lodgepole Pine/Spruce/Fir cover types (9/15/22).



High Intensity/Moderate Severity

Mid-elevation slopes in the Pine Creek drainage, in Douglas Fir cover types (9/12/22).



Moderate Intensity/Moderate Severity

Steep Gully along FR032 in the Pine Creek drainage, in Douglas Fir cover types (9/12/22).



Low Intensity/Low Severity

Open grass/conifer cover types at low elevation on south-facing slopes along the Salmon River Road (8/16/22).



Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	MOOSE FIRE					OWL FIRE		
	NFS	BLM	Private	Total	% within the Fire Perimeter	NFS	Total	% within the Fire Perimeter
Unburned	23,425	484	359	24,268	17.1%	194	194	25.9%
Low	56,666	1001	686	58,353	41.2%	408	408	54.6%
Moderate	44,010	386	213	44,609	31.5%	146	146	19.5%
High	14,518		17	14,535	10.3%	0	0	0.0%
<b>Total</b>	<b>138,619</b>	<b>1,871</b>	<b>1,276</b>	<b>141,766</b>		<b>747</b>	<b>747</b>	

**B. Water-Repellent Soil (acres):** Moose Fire - approximately 20,000 acres. Owl Fire – approximately 15 acres. Water repellent soils are likely present in areas of high burn severity in lodgepole and spruce/fir cover types, as well as some areas of moderate burn severity where heavy ground fuels caused extended periods of smoldering.

**C. Soil Erosion Hazard Rating:** Landtype Association Erosion Hazard Ratings for the burned area are shown in the table below:

LTA Erosion Hazard Rating	MOOSE FIRE		OWL FIRE	
	Acres	Percent	Acres	Percent
Low	21854	15%	174	23%
Moderate	65056	46%		
High	38147	27%	573	77%
Very High	14838	10%		
Data not available	1871	1%		
<b>TOTAL</b>	<b>141,766</b>		<b>747</b>	

**D. Erosion Potential:** Up to 2.12 tons/acre\*

*\* Based on ERMiT modeling for high burn severity on representative slopes of the Moose Fire, at the 20% probability that the sediment yield will be exceeded.*

**E. Sediment Potential:** Up to 1,005 cubic yards/square mile

**F. Estimated Vegetative Recovery Period (years):** 1-3 (grasses), 2-5 (woody), 10-50 (conifers)



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

Larger watersheds burned in the Moose Fire include the entire Moose Creek Watershed (18,572 acres), the entire Pine Creek Watershed (19,024 acres), and the upper portion of the Napias Creek Watershed (8,168 acres burned out of the 56,512-acre Napias Creek Watershed). A number of smaller watersheds surrounding these fires also burned, including many steep watersheds along the Salmon River Breaks.

While only 10.3% of the fire burned at high severity, the high severity burned areas were primarily concentrated in three general areas: 1) the headwaters of Pine Creek, 2) an area comprising the headwaters of Moose Creek, Daly Creek, Napias Creek, and Wallace Creek, and 3) scattered locations along smaller watersheds of the Salmon River Breaks. These areas all correspond to locations where the fire made significant wind-driven runs. Much of the interior of the burned area, including heavily forested but flatter terrain, remained unburned or burned at low severity. The table below shows the percentages of select watersheds burned at low, moderate, and high severity. These watersheds are depicted on the soil burn severity map (see Page 11).

Soil Burn Severity (20220923) by Watershed	Outside of burned area	Unburned	Low severity	Moderate severity	High Severity
Arnett Creek (12,060 acres)	37%	13%	16%	30%	4%
Beaver Creek (11,521 acres)	2%	6%	52%	32%	8%
Daly Creek at FR023 (6806 acres)	0%	52%	14%	12%	21%
Diamond Creek (2283 acres)	6%	18%	45%	29%	2%
Dump Creek (7528 acres)	0%	38%	29%	30%	3%
East Boulder at FR023 (6056 acres)	0%	38%	48%	12%	2%
East Boulder Creek (8509 acres)	0%	28%	44%	24%	4%
Hale Gulch at Camp (1231 acres)	0%	21%	45%	33%	0%
Hot Springs Creek (2901 acres)	3%	7%	70%	19%	0%
Jesse Creek u/s of Pollard Cr (5740 acres)	83%	3%	7%	5%	2%
Moose Creek (18,572 acres)	0%	21%	36%	29%	14%
Moose Creek at FR023 (9654 acres)	0%	29%	27%	25%	19%
Napias Cr at Leesburg (14,018 acres)	42%	9%	9%	19%	21%
Pine Creek (19,024 acres)	0%	7%	41%	35%	16%
Pollard Creek at Jesse Creek (6603 acres)	100%	0%	0%	0%	0%
Sage Creek (5230 acres)	72%	4%	21%	3%	0%
Trail Creek (8567 acres)	91%	1%	6%	1%	0%
Wallace Cr at FR023 (1875 acres)	0%	1%	5%	42%	52%
Wallace Creek (4901 acres)	12%	10%	18%	36%	24%

It is expected that post-fire runoff and erosion will be most pronounced in steep watersheds with a high component of moderate and high severity burn. High intensity, short duration rainfall typically occurs in this area during late summer thunderstorms. Storms often track up the Salmon River canyon, with higher risk associated with watersheds along the Salmon River breaks. Also, the large extent of the burned area may result in increased convection and storm development in this area as a result of the blackened ground.

The following locations have the highest level of concern for post-fire effects.

- 1) Wallace Creek: The Wallace Creek watershed above the Stormy Peak Road burned at 52% high severity and 42% moderate severity. The headwaters consist of a steep headwall, below which lies the 8-acre Wallace Lake along a tributary to Wallace Creek. Wallace Lake would attenuate high flows to some degree, but only in that tributary. Most of the riparian vegetation along Wallace Creek upstream of the Stormy Peak Road was consumed, and the channel is likely to become highly unstable. High flows, sediment, and dynamic channel movement are expected.



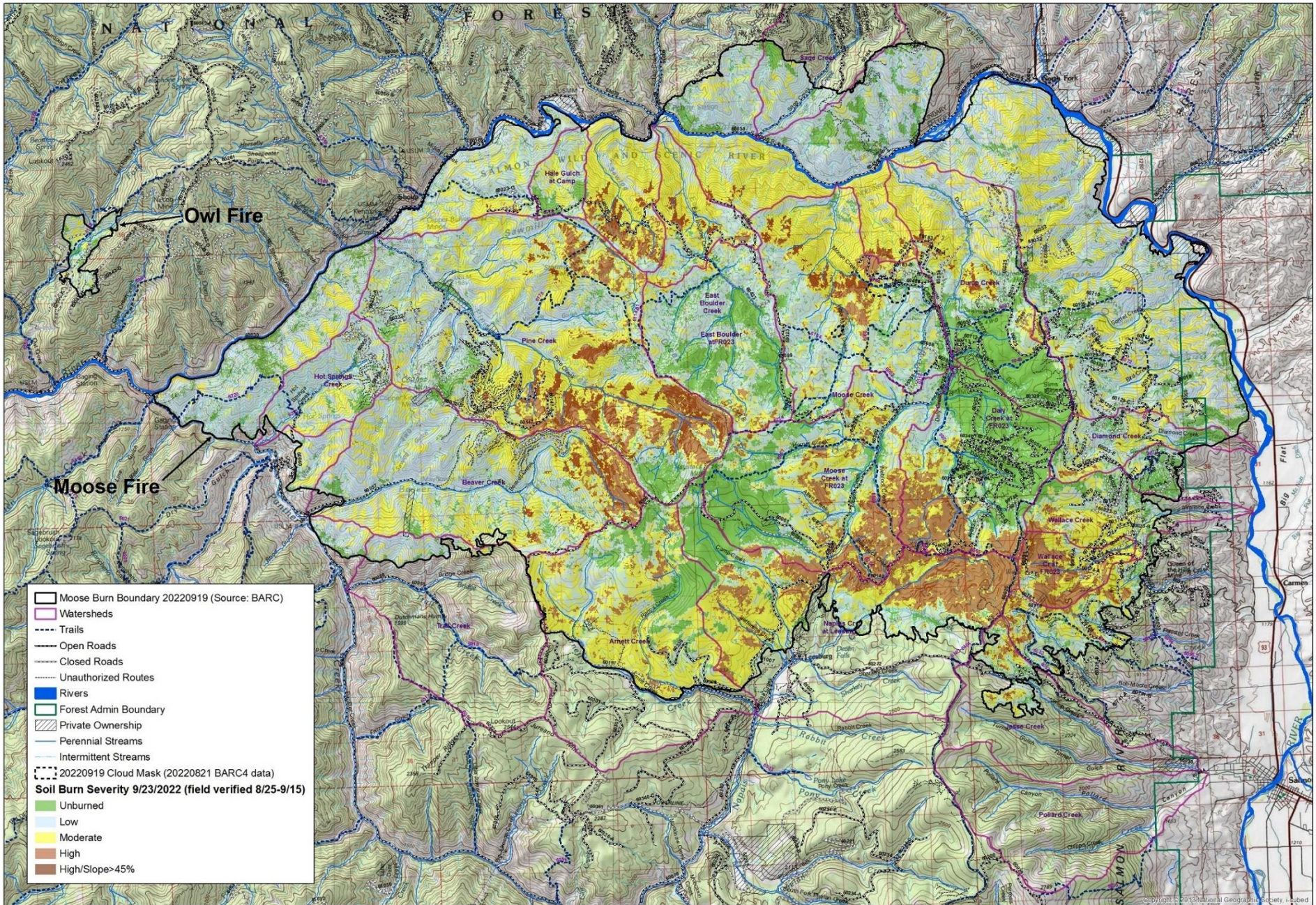
*Wallace Lake from the top of the ridge (9/15/22)*



*Wallace Creek 600 feet upstream of FR023 (9/15/22)*

- 2) Upper Napias Creek: The upper several miles of Napias Creek burned at high and moderate severity. The watershed upstream of Leesburg burned at 21% high severity and 19% moderate severity. With much of the riparian vegetation also consumed, it is expected that this drainage will experience high flows and potentially dynamic changes, with a large amount of sediment delivery into the lower portions of Napias Creek.
- 3) Salmon River Breaks watersheds: Dump Creek, Fan Gulch, Moose Creek, East Boulder Creek, and Sawlog Gulch all drain moderate and high severity burned areas located along the steep Salmon River Breaks. These drainages drop 2000 to 3000 feet over a relatively short distance. With increased runoff, loss of ground cover, hydrophobic soils, and the likelihood of high intensity precipitation events, debris flows are likely to occur in these drainages. Historically, these drainages have all produced alluvial fans along the Salmon River. As a result of post-fire flood events, existing fans may be destabilized, and new fan growth may occur into the Salmon River, affecting the river as well as the Salmon River Road on the opposite side of the river. Additional smaller drainages along the Salmon River Breaks could potentially experience blowouts to some degree during storm events, primarily because of the steep terrain and destabilization of soils as a result of the fire.
- 4) Pine Creek: The Pine Creek watershed burned at 16% high severity and 35% moderate severity. This is a steep watershed, and debris flows are likely in some of the headwater tributaries. The extent to which debris flows would potentially propagate down Pine Creek is dependent on the magnitude. Although the lower several miles of Pine Creek flows steeply through a narrow canyon that could serve as a transport reach during a debris flow, intact riparian vegetation upstream of and along this reach would likely attenuate some of these effects.

The remaining burned watersheds are of lower concern, with high severity burn occurring in 0 to 8% of these watersheds. Increased sediment production in these watersheds is possible, but would not likely lead to large scale destabilization. However, localized, small scale impacts are likely in these areas.



**9/23/2022 Burn Intensity Map for the Moose and Owl Fires, Salmon-Challis National Forest, with proposed BAER treatments**

Map created 10/17/2022 by the Salmon-Challis National Forest Moose Fire BAER Team. BARC Data and Fire Perimeter from analysis of Landsat 9 satellite data, by USDA Forest Service, Geospatial Technology and Applications Center, BAER Imagery Support Program. BARC imagery date: 9/19/2022. This map shows burn intensity (vegetative scorch) derived from BARC data, adjusted based on observations and field verification conducted 8/25/2022 through 9/15/2022. Unadjusted BARC4 data from 8/21/2022 BARC dataset were used for a small, 260-acre area of cloud cover. Burn Boundary Acreages - Moose Fire: 141,702 acres. Owl Fire: 747 acres. Additional fire growth is possible.



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

### **Introduction/Background**

The Moose Fire started on July 17, 2022, as a result of human causes from an unextinguished campfire, near the mouth of Moose Creek along the Salmon River downstream of North Fork, Idaho. The fire initially spread rapidly as a result of high winds, extremely low fuel moisture, and the steep terrain of the Salmon River Breaks. The fire then continued to spread primarily to the south, east, and west. Although a portion of the fire also initially burned to the North, firefighters were able to control additional spread of the fire to the North, using the Salmon River Road and Salmon River as a control line. Also, despite an initial spot fire that occurred across Highway 93 to the east, firefighters were able to use the Salmon River and Highway 93 as a control line to prevent spread of the fire east of the river.

The fire burned for over three months, with occasional large runs fueled by thunderstorm-driven winds. Extensive backburning operations were conducted to protect property along the Salmon River corridor along the eastern edge of the fire, and to fortify large fuel breaks along the Ridge Road and toward Diamond Creek (the Diamond Line). High fire activity occurred in the headwaters of the Pine Creek drainage in the early stages of the fire. The 2000 Clear Creek Fire scar to the west then moderated fire activity along Panther Creek, but the fire was able to advance southward into the thick timber of the Napias Creek drainage. Extensive efforts were made to protect the Salmon Municipal Watershed (Jesse Creek, Pollard Creek, and Chipps Creek) and ultimately the community of Salmon, Idaho through construction of large fuel breaks along the ridge as well as contingency lines at lower elevations. A wind-driven event on September 7 caused the fire to cross the fuel break along the ridge, become established in a small portion of the municipal watershed, and burn through the Wallace Creek drainage. Fortunately, favorable weather returned to the area in mid-September, minimizing further spread of the fire. The fire will continue to smolder until a season-ending event occurs in late Fall.

The Owl Fire, located several miles west of the Moose Fire, was started by lightning on September 8. This fire burned within the fire scar of the 2012 Mustang Fire on primarily open south-facing grass/conifer slopes. This fire burned for about 1 week, with low to moderate fire behavior. Although it continued to smolder, no additional spread occurred after September 14 as a result of more favorable weather. This fire was initially managed as a separate fire, but management of the fire was ultimately transferred to the team managing the Moose Fire.

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

*Table 5: Critical Value Matrix*

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	<b>RISK</b>		
Very Likely	<b>Very High</b>	<b>Very High</b>	<b>Low</b>
Likely	<b>Very High</b>	<b>High</b>	<b>Low</b>
Possible	<b>High</b>	<b>Intermediate</b>	<b>Low</b>
Unlikely	<b>Intermediate</b>	<b>Low</b>	<b>Very Low</b>

**1. Human Life and Safety (HLS):**

**BAER Value:** Human life and safety on or in close proximity to burned NFS lands

**What is at Risk:** Human life and safety

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Possible	Possible
<b>Consequences</b>	Major	Moderate
<b>Risk</b>	High	Intermediate

**Comments:**

Moose Fire: Increased risk of hillslope erosion, rockfall, hazard trees, high flows, and debris flows will likely be present for 3 to 5 years following the fire. Forest roads and trails access much of the portion of the burned area, and this area is popular for dispersed camping, recreation, rafting, hunting, fishing, and firewood gathering. While these hazards exist throughout the burned area, the Salmon River Road is a particular concern because of steep slopes that have become destabilized as a result of the fire, and the high level of use along the road. 13.2 miles of the Salmon River Road are likely to be directly impacted by this fire (from Deadwater to Indian Creek, and from Pine Creek to Panther Creek). Although alternate routes do exist, ingress and egress for private residences along the Salmon River Road are a concern if the road were to become impassible. Increased amounts of deadfall along roads and trails in the burned area are likely to be a concern for at least 5 to 10 years, and potentially longer. Increased risks to river users, particularly from Deadwater to Indian Creek, will also be present as a result of falling trees, rockfall, and debris entering the river channel.

Owl Fire: Post-fire risks in the burned area of the Owl Fire are generally related to hillslope erosion, rockfall, and hazard trees over the next 3 to 5 years. This area is relatively remote, with few visitors. Post-fire recovery is expected to occur relatively quickly in this area of mostly low to moderate burn severity.

**2. Property (P):**

**BAER Value:** Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands

**What is at Risk:** Open Forest Roads

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Likely	Unlikely
<b>Consequences</b>	Major	Minor
<b>Risk</b>	Very High	Very Low

**Comments:**

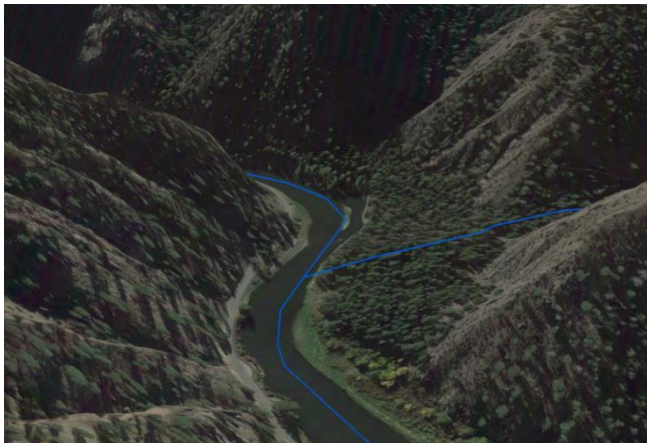
Moose Fire: 201.9 miles of open Forest system roads exist within the burned area. While this is a heavily roaded area, potential post-fire impacts to roads are limited to several specific locations, as discussed below:

- Salmon River Road (FR60030): The fire burned adjacent to the Salmon River Road downstream of North Fork over a distance of 6.7 miles adjacent to the paved section of the Salmon River Road (Deadwater to Indian Creek) and 6.5 miles adjacent to the unpaved section of the Salmon River Road (Pine Creek to Panther Creek). This road provides vital access to private property and a number of USFS recreation sites down-river. De-stabilization of the steep slopes above the road in these locations will lead to a considerable increase in erosion, rockfall, and potentially mass wasting events affecting the road. Both of these sections of road include in inside ditch that catches material and provides drainage. Additional drainage structures are present where 22 small drainages intersect these sections of the road. With the likely influx of material from these de-stabilized hillslopes into the ditch and onto this road, it is important that proper drainage is maintained in order to prevent damage or loss of the road, particularly during storm events.

*Salmon River Road just upstream of Panther Creek, with steep, burned hillslope and inside ditch (10/5/22).*



- Salmon River Road (FR60030): High severity burn that occurred in drainages on the opposite side of the river from the Salmon River Road has the potential to result in debris flow events into the Salmon River. Several locations were identified where debris flow fan deposits from the opposite side of the river could deflect the flow of the river into the bank along the Salmon River Road, potentially causing bank erosion, bank loss, and/or loss of the road. Options for mitigating these risks to the road are very limited, as it is not possible to determine the exact location and magnitude of any potential impacts, and it is not feasible to reinforce the bank along the road in all of these locations.



Options for mitigating these risks to the road are very limited, as it is not possible to determine the exact location and magnitude of any potential impacts, and it is not feasible to reinforce the bank along the road in all of these locations.

*A debris flow from Sawlog Gulch (right), much of which burned at moderate and high severity, could push the Salmon River against its northern bank and impact the Salmon River Road (left) (image from Google Earth).*

- Pine Creek Road (FR60032): The Pine Creek watershed burned at 16.1% high severity, with most of this high severity burn occurring in the upper headwaters. The potential exists for debris flow events to occur in the headwater tributaries of Pine Creek, which could potentially impact the main stem of Pine Creek. The Pine Creek Road crosses Pine Creek at 5 locations (4 bridges and 1 culvert) within the 1.8-mile long, steep, narrow section of the drainage downstream of Pine Creek Ranch, and the Salmon River Road crosses Pine Creek with a bridge at its mouth. With the exception of the Salmon River Road crossing, these crossings were determined to be at moderate to high risk of overtopping, loss of the structure, and/or damage to the road bed in the case of a flood or debris flow event, as a result of relatively high gradient (6% average valley gradient), and low freeboard of the bridges, alignment issues, and the narrow nature of the canyon with the road in close proximity to the Pine Creek channel. Intact riparian vegetation along this section of Pine Creek is likely to attenuate flood flows, catch debris, and lessen these potential impacts. Some of these bridge are light and set on grade jam beams, making them more susceptible to being lifted and moved off the footings by a debris jam

or flood flow. These bridges also carry a phone line that serves private property at the Pine Creek Ranch. A total of 24 belt deflector drainage structures are also in place along this section of road to control drainage. It is important to maintain proper drainage along this road, particularly at these crossings, in order to prevent loss of the road and stream crossing structures.



*Assessing the lowermost bridge on Pine Creek Road #032 (9/7/22)*

- Stormy Peak Road (FR60023):** The heavily used Stormy Peak Road provides vital access to a large portion of the Salmon-Challis National Forest for a variety of uses. The largest risk to this road occurs at the crossing of Wallace Creek. The Wallace Creek drainage above the Stormy Peak Road burned 52% at high severity, and 42% moderate severity. Erosion, flooding, and debris flows in this drainage are likely to occur and may result in dynamic changes affecting the Stormy Peak Road. The road currently includes a 27-inch x 35-inch culvert on Wallace Creek, in addition to an inside ditch that drains under the road in another 18-inch culvert. These culverts likely do not provide enough capacity for the expected increased streamflows, sediment, and debris during post-fire conditions in this drainage. Wallace Creek averages 10% gradient or greater in the mile upstream of this crossing. With the riparian area completely burned and excessive downed logs in the channel as a result of the fire (*see photo on page 10*), dynamic changes are likely to occur in this channel. The valley width at the crossing is greater than 300 feet, and the potential also exists for the channel location to migrate at the road crossing.



*Left: Wallace Creek culvert at FR023, looking upstream. Right: Relief culvert on FR023. The Wallace Creek culvert is at the location of the vehicle. The inside ditch carries some flow to the relief culvert (9/15/22).*

**Owl Fire:** No open roads exist within the burned area, and no roads are at risk.

**BAER Value:** Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands

**What is at Risk:** USFS Trails

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Likely	Unlikely
<b>Consequences</b>	Moderate	Moderate
<b>Risk</b>	High	Low

**Comments:**

**Moose Fire:** A total of 75.2 miles of trails exist within the burned area (this excludes 10.6 miles of snow trails on roads). These trails consist of motorized and non-motorized trails that are generally used for hiking, mountain biking, motorcycle/ATV use (where allowed), stock use, hunting access, grazing access, and outfitting. Many portions of these trails are at risk of erosion and potentially loss of trail investment as a result of increased post-fire runoff, soil erosion, and/or debris flows. The highest risk to trails occurs where trails are situated within any high severity burned area, or within or below steep slopes burned at moderate severity. High risk may also occur to trails that are located adjacent to streams in drainages that burned at moderate and high severity. It is important to implement drainage control on these trails in order to prevent loss of the trail investment. The trail segments shown in the table below were determined to be at high risk.



*Right: A portion of the Stormy Peak-Virginia Trail #6176 in high/moderate severity burned area of the Moose Fire (9/30/22).*

TRAIL NAME	TRAIL #	DESIGNATION	MILES AT RISK	DESCRIPTION
Virginia Gulch Trail	#6175	non-motorized	1.5	This steep trail passes through 1.5 miles of high intensity/moderate severity burn on steep slopes just SW of Stormy Peak.
Stormy Peak-Virginia Trail	#6176	non-motorized	1.2	A 0.6-mile long section of this trail follows a ridge burned at high severity just north of Stormy Peak. Also, in China Gulch, this trail crosses a few sections of steep slopes burned at moderate severity over a distance of about 0.6 miles.
Hornet Creek Trail	#6067	motorized	0.5	This trail passes through about 0.5 miles of high severity burn on moderate slopes.
Daly Creek	#6076	motorized	1.5	This trail passes through about 1.5 miles of high severity burn on moderate slopes.
Moose Creek Driveway	#6065	motorized	1.5	This trail passes through about 1.5 miles of high severity burn on moderate slopes.
Coffee Gulch	#6064	motorized	0.5	This entire 0.5-mile trail passes through high severity burn on moderate slopes.
Webfoot Trail	#6098	non-motorized	1.5	This trail passes through about 1.5 miles of high severity burn on moderate slopes. Trail is infrequently used and may be impassable from deadfall.
Beartrack Trail	#6234	non-motorized	1.1	Nearly the entire trail passes through mostly high/partially moderate severity burn on moderate slopes. Trail is infrequently used and may be impassable from deadfall.
<b>TOTAL</b>			<b>9.3</b>	

Deadfall has also been a persistent problem along many of these trails, and this is likely to increase considerably over the next 10+ years within the burned area, affecting trail passability and potentially affecting drainage.

**Owl Fire:** Only 0.9 miles of trail exist within the burned area. This is a little-used non-motorized trail along East Fork Owl Creek. Because of the low burn severity in this fire, erosion risk along this trail is minimal. However, deadfall is likely to increase.



**BAER Value:** Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands

**What is at Risk:** Administrative Sites, Campgrounds

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Possible	Unlikely
<b>Consequences</b>	Moderate	Moderate
<b>Risk</b>	Intermediate	Low

**Comments:**

Moose Fire: Despite the high road and trail density in the burned area, developed sites such as campgrounds or trailheads are limited. The Wallace Creek Campground is the only developed site within the burned area that is at risk from post-fire flood events. This campground is adjacent to Wallace Lake, within an extensive area that was burned at high and moderate severity. Post-fire risks in the watershed are high, but limited at the campground because of the gentle topography at the location of the campground and its distance from any stream channel. However, dynamic changes affecting Wallace Lake, its outlet, and Wallace Creek downstream of the lake are possible as a result of post-fire storm events. Hazard trees at this campground are a major concern.

Owl Fire: No developed sites are located within or downstream of the burned area.

**BAER Value:** Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands

**What is at Risk:** Private Property within or adjacent to National Forest System lands

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Possible	Unlikely
<b>Consequences</b>	Major	Moderate
<b>Risk</b>	High	Low

**Comments:**

Moose Fire: Numerous private parcels are located within the burned area of the Moose Fire, totaling 1276 acres. Some risks exist to private property within the burned area related to the effects of post-fire runoff at 3 locations.

- 1) Beartrack Mine includes private property as well as Forest Service land under a mining plan of operations. Impacts to the Beartrack Mine are discussed under 'Mines on National Forest Lands.'
- 2) The Salmon River High Adventure Camp is located on an alluvial fan at the mouth of Hale Gulch. Hale Gulch drains 1231 acres, of which 0% burned at high severity and 33% burned at moderate severity. The potential for a debris flow in this drainage is low, but a small amount of risk does exist to infrastructure and operations on this property in the short term (1 to 3 years) if a high intensity, short duration rainfall event were to occur in this watershed.
- 3) The Pine Creek Ranch is situated along Pine Creek 2 to 3 miles upstream from the Salmon River. The ranch itself was unburned or burned at low severity, but high severity burn occurred in the headwaters of Pine Creek. The potential exists for a debris flow generated in the upper watershed to reach this property, but because of the wide, low gradient valley morphology at this location, any impacts would likely be limited.

Additional risks may exist to private property located adjacent to the burned area and downstream of drainages that may experience post-fire flood events.

Owl Fire: No private parcels exist within the burned area. Private property exists at the mouth of Owl Creek along the Salmon River Road. The potential for flood impacts to these properties is very low because only 2% of the Owl Creek watershed burned.

**BAER Value:** Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands

**What is at Risk:** Diversions on National Forest System lands

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Likely	Unlikely
<b>Consequences</b>	Moderate	Moderate
<b>Risk</b>	High	Low

**Comments:**

Moose Fire: Several diversions exist on Forest Service land within the burned area. Most of these diversions are maintained and operated by private users under special use permits for use on private lands.

- 5 diversions exist on Wallace Creek within the Forest boundary, although not all of these are active. About 24% of the Wallace Creek watershed burned at high severity. The debris flow risk at these diversions is high.
- A diversion on Pine Creek serves the Pine Creek Ranch. 16% of the Pine Creek watershed burned at high severity. The debris flow risk at this diversion is moderate.

Owl Fire: No diversions are likely to be affected by post-fire storm events.

**BAER Value:** Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands

**What is at Risk:** Moose Creek/Dump Creek Control Structure and Moose Creek Artificial Channel

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Possible	NA
<b>Consequences</b>	Moderate	NA
<b>Risk</b>	Intermediate	NA

**Comments:**

Moose Fire: A large watershed improvement project in 1979 (the Dump Creek Watershed Project) included the construction of a concrete structure to “re-divide” Moose Creek and Dump Creek where Moose Creek was “captured” by Dump Creek as a result of historic mining operations in the late 1800s. This stream capture had resulted in massive downcutting and de-stabilization of the lower portion of Dump Creek and the development of a large alluvial fan along the Salmon River. The structure built to “re-divide” Moose Creek and Dump Creek also included construction of approximately 6,700 feet of constructed channel for Moose Creek below the diversion site. This project helped to stabilize the Dump Creek channel within the deep chasm that resulted from the stream capture, and also stabilize the Dump Creek alluvial fan at the Salmon River.

The entire Moose Creek and Dump Creek watersheds are within the burn boundary of the Moose Fire. However, the structure constructed between Moose Creek and Dump Creek and the area surrounding it remained unburned during the fire. Portions of the constructed Moose Creek channel were burned at low severity. Upstream of the structure, the Moose Creek watershed burned at 19% high severity/25% moderate severity, primarily in the upper headwaters, and the Dump Creek watershed was almost entirely unburned. High flows and debris in Moose Creek could potentially overtop and/or damage the structure. However, large post-fire flood events or debris flows are not expected to occur at this location because of the low gradient nature of the Moose Creek channel upstream of the structure and the intact riparian vegetation, both of which would attenuate streamflows and capture debris well before reaching the structure. There is a low risk that the constructed channel of Moose Creek could be breached as a result of de-stabilization during the fire and/or high post-fire flow events. If this were to occur, streamflows would ultimately go into Dump Creek, which could result in further destabilization within the Dump Creek drainage.

**BAER Value:** Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands

**What is at Risk:** Mines on National Forest System lands

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Possible	Unlikely
<b>Consequences</b>	Moderate	Moderate
<b>Risk</b>	Intermediate	Low

**Comments:**

Moose Fire: Much of the Beartrack Mine lies within the burned area. This large mine is in reclamation status, with ongoing treatment of all groundwater flow through the mine, as well as monitoring of water quality. Direct effects of the fire to the mine were minimal. However, the areas to the west, north, and east of the mine burned at mostly moderate and high severity. This will likely result in some changes to flow regimes and water chemistry in the mine area, which may potentially result in required changes in the discharge regime of treated water from the mine into Napias Creek to meet permitting requirements. Two drainages upslope of Beartrack Mine also have the potential to impact mine infrastructure. Camp Creek was mostly unburned in its headwaters, but moderate and high severity burn in the lower portion of the watershed may result in increased streamflows and sediment loads coming into the mine. Wards Gulch is an intermittent stream that drains through the upper portion of Beartrack Mine. The upper portion of this drainage, just upstream of the mine, burned at mostly high severity, and there is a risk of high flows, sediment, and potentially debris flows impacting the mine at this location. However, the tailings cap at this mine was engineered to withstand large flow events, and the likelihood of compromising the integrity of the tailings is low.

Owl Fire: No mines exist within the burned area of the Owl Fire.

**BAER Value:** Buildings, water systems, utility systems, road and trail prisms, dams, wells, or other significant investments on or in close proximity to burned NFS lands

**What is at Risk:** Salmon Municipal Watershed

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Unlikely	NA
<b>Consequences</b>	High	NA
<b>Risk</b>	Low	NA

**Comments:**

Moose Fire: The Municipal Watershed for the City of Salmon includes the drainages of Jesse Creek, Pollard Creek, and Chipps Creek. Chipps Creek joins Pollard Creek, Pollard Creek then joins Jesse Creek, and these drainages are collectively known as the Jesse Creek Watershed, draining a total of 12,344 acres of mostly Forest Service land upstream of the water treatment plant for the City of Salmon. The Moose Fire only burned 7.8% of the Salmon Municipal Watershed, in a forested portion of the upper drainage of Jesse Creek. No fire occurred in the Pollard Creek or Chipps Creek drainages. Only 1.1% of the Salmon Municipal Watershed burned at high severity, and 2.1% burned at moderate severity. This watershed provides a clean and relatively consistent supply of water for the City of Salmon, which has a water treatment plan on city lands near the mouth of the Jesse Creek canyon. Because of the small percentage of the watershed that burned and the limited amount of high severity burn, post-fire impacts to water quality and water quantity are likely to be minimal. The springs located at the head of Jesse Creek, where much of the perennial streamflow is produced, were not affected by the fire and will continue to provide high quality water. The potential for increased sediment production as a result of the fire is low. Any

increased sediment loads are likely to be captured in the quarter-mile long section of Jesse Creek that flows sub-surface beneath talus, or the sediment retention pond maintained by the City upstream of the diversion to the water treatment plant. The fire may also result in minor impacts to water quality in the short term.



*Looking down from the head of Turner Gulch (Jesse Creek Watershed), 9/29/2022. A small amount of burn can be seen on the ridge between Turner Gulch and Jesse Creek.*

**3. Natural Resources (NR):**

**BAER Value:** Soil productivity and hydrologic function on burned NFS lands  
**What is at Risk:** Soil erosion and stream channel function

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Likely	Possible
<b>Consequences</b>	Minor	Minor
<b>Risk</b>	Low	Low

**Comments:**

Moose Fire and Owl Fire: Increased soil erosion will likely occur in areas of high and moderate burn severity. Ground cover will likely recover quickly (1-3 years) in low and moderate severity burned area, and over a period of 3 to 5 years in high severity burned areas. Post-fire flooding and/or debris flow events are likely to occur to some degree, likely where high burn severity is concentrated in the upper portions of watersheds. It is expected that some drainages will experience debris flow events that may alter the hydrologic regime on a localized scale over a scale of decades. However, fire is a natural part of this landscape, and any hydrologic impacts resulting from this fire will not alter the overall natural balance between runoff and erosion on a larger watershed scale.

**BAER Value:** Critical habitat or suitable occupied habitat for federally listed threatened or endangered terrestrial, aquatic animal or plant species on or in close proximity to burned NFS lands  
**What is at Risk:** Chinook, Steelhead, and Bull Trout Habitat

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Possible	Unlikely
<b>Consequences</b>	Moderate	Minor
<b>Risk</b>	Intermediate	Very Low

**Comments:**

Moose Fire: Several ESA-listed fish (Chinook salmon, steelhead, and bull trout) and their designated critical habitats occur within the burn boundary. Chinook salmon and its critical habitat have the most limited distribution in the burn area—occurring in the Salmon River, and the lower ¼ mile of Dump, Moose, East Boulder, and Pine Creeks. The distribution of steelhead and its critical habitat is also fairly limited within the burn area: the Salmon River, the lower reaches of Dump and Moose Creeks, Pine Creek, and Beaver Creek. Bull trout and its critical habitat are widely distributed within the burn boundary, including the Salmon River, Pine Creek, Moose Creek, Beaver Creek, Napias Creek and its many tributaries (Arnett, Rapps, Jefferson, Camp, and Sawpit Creeks). Overall, the fire appears to have mimicked natural fire patterns that would have historically occurred in this area and are critical to developing and maintaining quality fish habitat and fish populations by introducing woody material and spawning gravel to the stream systems through increased erosion

and debris flow events. If post-fire storm events result in large floods and/or debris flows, impacts could occur to individual stream segments for many years. However, it is anticipated that those impacts would be localized and would have a relatively small impact on the overall balance at a larger watershed scale.

In terms of high and moderate burn severity areas, impacts are expected to be most pronounced in Pine Creek, Moose Creek, and the headwaters of Napias Creek. A field visit to Pine Creek showed most of the riparian area is still intact and the creek should continue to function as thermal refugia from the Salmon River. The headwaters of Moose Creek that burned at high severity is unoccupied critical habitat for bull trout. Moose Creek will likely experience ash/sediment issues during run-off, but there are long reaches of intact riparian vegetation to help attenuate these impacts. The resident bull trout in the headwaters of Napias Creek upstream of Devlin Falls are believed to be isolated from the rest of Napias Creek and thus at risk from stochastic events. This area burned at moderate-to-high severity and post-fire changes in water quality, quantity, and habitat are expected to impact fish production. It is possible this isolated group of bull trout could be extirpated if Devlin Falls acts as a barrier to recolonization. However, the bull trout upstream of Devlin Falls constitute a small proportion of the resident bull trout population in Napias Creek, and an even smaller proportion of the Panther Creek local population that is managed for recovery of the species. In severely burned streams, fish habitat and productivity typically rebounds in 5-10 years given sufficient connectivity.

The fire also impacted two high mountain lakes, Wallace and UP Lakes. Post-fire run-off may increase nutrient delivery to lakes, potentially causing bottom-up impacts to foodwebs. These effects are expected to be temporary or pulsed in nature. These lakes have low natural ability to support trout and are regularly stocked with hatchery fish to sustain the populations. Fish kills in these mountain lakes are not uncommon irrespective of fire (e.g., due to ice-related oxygen deprivation), and recurrent stocking is an inherent part of managing these artificial fisheries.

Owl Fire: Within the burned area, ESA-listed bull trout and steelhead and steelhead designated critical habitat are present in the East Fork of Owl Creek. Downstream of the burned area, Owl Creek supports a diverse fish assemblage including bull trout, steelhead, Chinook salmon, and designated critical habitat for each of these species. The fire appears to have mimicked natural fire patterns that would have historically occurred in this area and are critical to developing and maintaining quality fish habitat and fish populations by introducing woody material and spawning gravel to the stream systems through increased erosion and debris flow events. Because of the predominantly low to moderate burn severity in this fire, post-fire flood events and debris flows are not expected, and aquatic habitat is not likely to be impacted.

**BAER Value:** Native or naturalized communities on NFS lands where invasive species or noxious weeds are absent or present only in minor amounts

**What is at Risk:** Native Plant Communities / Spread of invasive species

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Likely	Likely
<b>Consequences</b>	Moderate to High	Moderate
<b>Risk</b>	High	High

**Comments:**

Moose Fire and Owl Fire: The invasive plant species known to be present in the area have the potential to disrupt native plant community reestablishment in areas otherwise uninfested by noxious weeds. Invasive plant species inventoried in the burned area currently include large infestations of spotted knapweed, particularly along roads, as well as numerous smaller infestations of invasive plant species that are of particularly high concern. The area burned in the Moose Fire is of very high value for native plant communities and big game habitat values. The high density of roads and trails within the burned area increases the risk to susceptible areas, particularly in the first year following the fire. Fire suppression impacts, including extensive use of dozer lines, hand

lines, and removal of large volumes of timber also have considerable potential to result in the spread of invasive plants in the burned area of the Moose Fire. It is important to control the spread of invasive plants into areas burned by the fire. Specific risks associated with the spread of invasive plants are in the process of being evaluated.

**4. Cultural and Heritage Resources:**

**BAER Value:** Cultural resources on NFS lands which are listed on or potentially eligible for the National Register of Historic Places

**What is at Risk:** Historic Properties

	<b>MOOSE FIRE</b>	<b>OWL FIRE</b>
<b>Probability</b>	Possible/Likely	Unlikely
<b>Consequences</b>	Moderate	Moderate
<b>Risk</b>	Intermediate/High	Low

**Comments:**

Moose Fire: Values at risk relating to Heritage and Cultural Resources include diminished National Register of Historic Places (NRHP) values of sites listed, eligible for listing, or potentially eligible for listing on the NRHP. The Moose Fire occurred on NFS lands where previously recorded archaeological and cultural sites evaluated for NRHP eligibility were located. Within the fire area approximately 170 known historic properties determined NRHP eligible are located along with numerous identified archaeological sites that remain unevaluated for NRHP eligibility. Of the 170 eligible or listed properties, two were determined to have values at-risk of damage or destruction and the probability of occurrence is such that an emergency response is warranted. One of these sites is listed on the NRHP, and the other has been determined to be eligible for listing.

Following the burn event, areas within these Historic Properties have been denuded of surface vegetation leaving exposed artifact concentrations and features previously obscured from view. These resources are now much more visible on the surface and therefore subjected to an increased risk of looting or vandalism. In addition, both properties are easily accessible as they are located in close proximity to established NFS system roads that are frequently traveled. One site may also be at an increased risk of inundation due to a greater potential for upslope erosion and debris transport. However, the relative level of risk to the individual site is inconclusive and therefore no specific treatment actions to address increased potential for inundation are recommended at this time.

Owl Fire: No known heritage or cultural resources were found to have values at risk of damage or destruction as a result of post-fire conditions.

**B. Emergency Treatment Objectives:**

- Reduce the risk of loss of Forest road and trail infrastructure.
- Reduce the risk of loss of heritage and cultural resources.
- Decrease risk to public life and safety within the burned area.

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

**Land:** N/A

**Channel:** N/A

**Roads/Trails:** 80%

**Protection/Safety:** 80%

**D. Probability of Treatment Success**

Table 6: 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%	70%	70%
<b>Protection/Safety</b>	75%	75%	75%

**E. Cost of No-Action (Including Loss):**

The cost of no action is estimated to be \$669,000 (See VAR Worksheet). This includes the following:

- **FR032:** Replacement cost for 1.8 miles of Pine Creek Road and 5 stream crossings is \$322,000.
- **FR030:** Cost to repair/replace drainage crossings on 13 miles of Salmon River Road is \$220,000.
- **FR023:** Replacement cost for road and crossing at Wallace Creek on Stormy Peak Road is \$60,000.
- **Trails:** Cost to repair/replace 6.7 miles of trail at high risk (at \$10,000/mile) is \$67,000.
- **Heritage/Cultural Resources:** The cost of no action cannot be quantified.
- **Human life and safety:** The cost of no action cannot be quantified.

**F. Cost of Selected Alternative (Including Loss):** The total cost of proposed treatments is \$77,988. Implementing the proposed treatments would reduce the probability of experiencing this loss by 0.40 (40%). The expected benefit of treatment would be \$267,600. Treatment is justified.

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

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

**Team Leader:** David Deschaine

**Email:** david.deschaine@usda.gov

**Phone(s):** (208)756-5171

**Forest BAER Coordinator:** David Deschaine

**Email:** david.deschaine@usda.gov

**Phone(s):** (208)756-5171

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

<b>Skill</b>	<b>Team Member Name</b>
<i>Team Lead(s)</i>	David Deschaine
<i>Soils</i>	Deanna Stever
<i>Hydrology</i>	Bill MacFarlane/Dave Deschaine
<i>Engineering</i>	Pete Schuldt
<i>GIS</i>	Bill MacFarlane
<i>Archaeology</i>	Jason Coats
<i>Weeds</i>	Diane Schuldt
<i>Recreation</i>	Skeet Townley
<i>Fisheries</i>	Keats Conley

## H. Treatment Narrative:

### Land Treatments:

#### EDRR Weed Treatments

A proposal for Early Detection Rapid Response (EDRR) management activities on invasive plant species within and adjacent to the burned area is in development, but was not available at the time of this report. Areas around known infestations along existing roads and trails will be examined for potential expansion into previously uninfested areas. EDRR activities will begin at known weed infestations and then radiate out from these epicenters to detect, map and treat new infestations. Chemical treatment will be the primary method used, and all herbicides proposed for use are covered under the Salmon-Challis National Forest Invasive Plant Treatment Final Environmental Impact Statement (November 2015).

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### Channel Treatments:

No channel treatments proposed at this time.

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### Roads and Trail Treatments:

#### Salmon River Road (FR60030) Ditch and Catchment Basin Cleanout (MOOSE FIRE):

The Moose Fire burned steep hillslopes along 6.7 miles adjacent to the paved section of the Salmon River Road (Deadwater to Indian Creek) and 6.5 miles adjacent to the unpaved section of the Salmon River Road (Pine Creek to Panther Creek). These slopes are susceptible to erosion, rockfall, and mass wasting events, and these risks are greatly amplified in the short term (1 to 3 years) following wildfire.

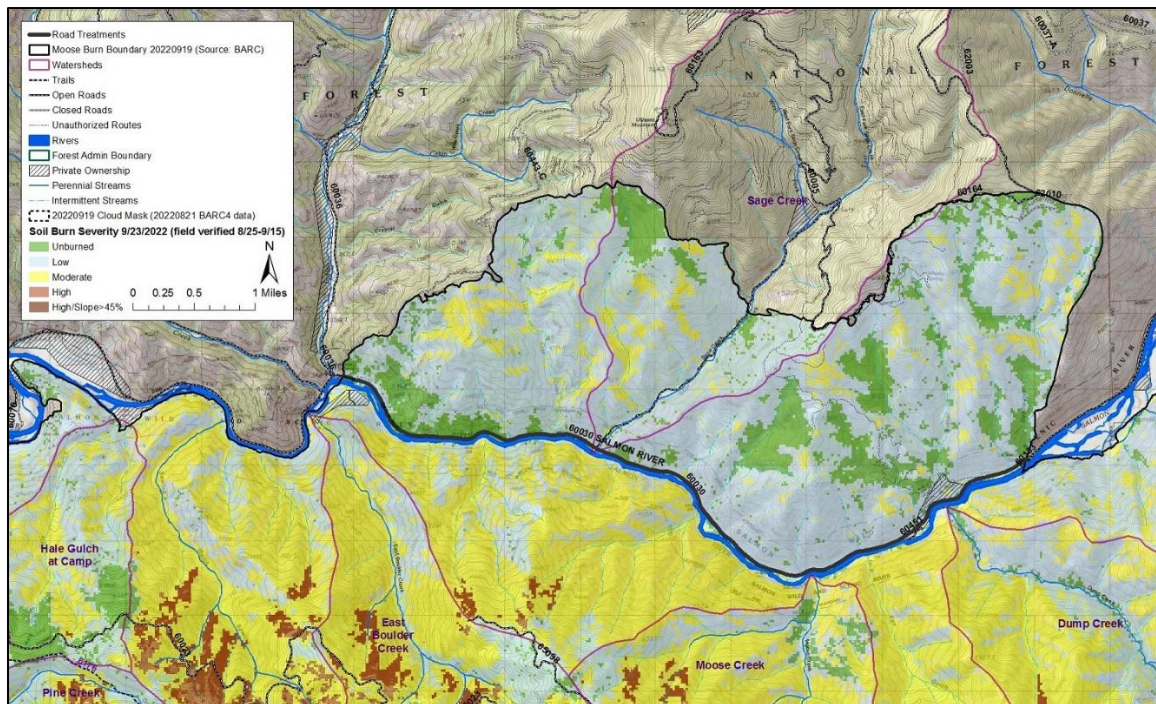
The purpose of this treatment is to maintain the effectiveness of roadside ditches and culverts to properly route runoff off the road in order to protect the transportation infrastructure. Much of the existing roadside ditch and many existing culvert catch basins are filled with organic debris, sediment, or rock, in many cases partially blocking the culvert inlet. Additional material is likely to be mobilized. It is important to maintain as much capacity as possible in culverts and ditches prior to the first damaging storm event in order to prevent obstruction that would route water onto the road and cause erosion or loss of the road. This is the most cost-effective method of protecting roads that cross at-risk streams and hillslope drainages. Maintaining adequate ditch capacity would also help catch material from these hillslopes that would otherwise roll out onto the road, thereby improving public safety and access along this vital road corridor, which provides access to private property, as well as public river access points, trailheads, and campgrounds.

Preventative maintenance including ditch cleaning and catchment basin cleanout would occur along the 6.7-mile paved section of road between North Fork and Spring Creek and the 6.5-mile unpaved section between Pine Creek and Panther Creek to accommodate the expected increase in rockfall and erosion and to ensure proper function of the culverts draining the numerous small drainages that cross the road. This work is generally done using a loader and backhoe along with a number of dump trucks.

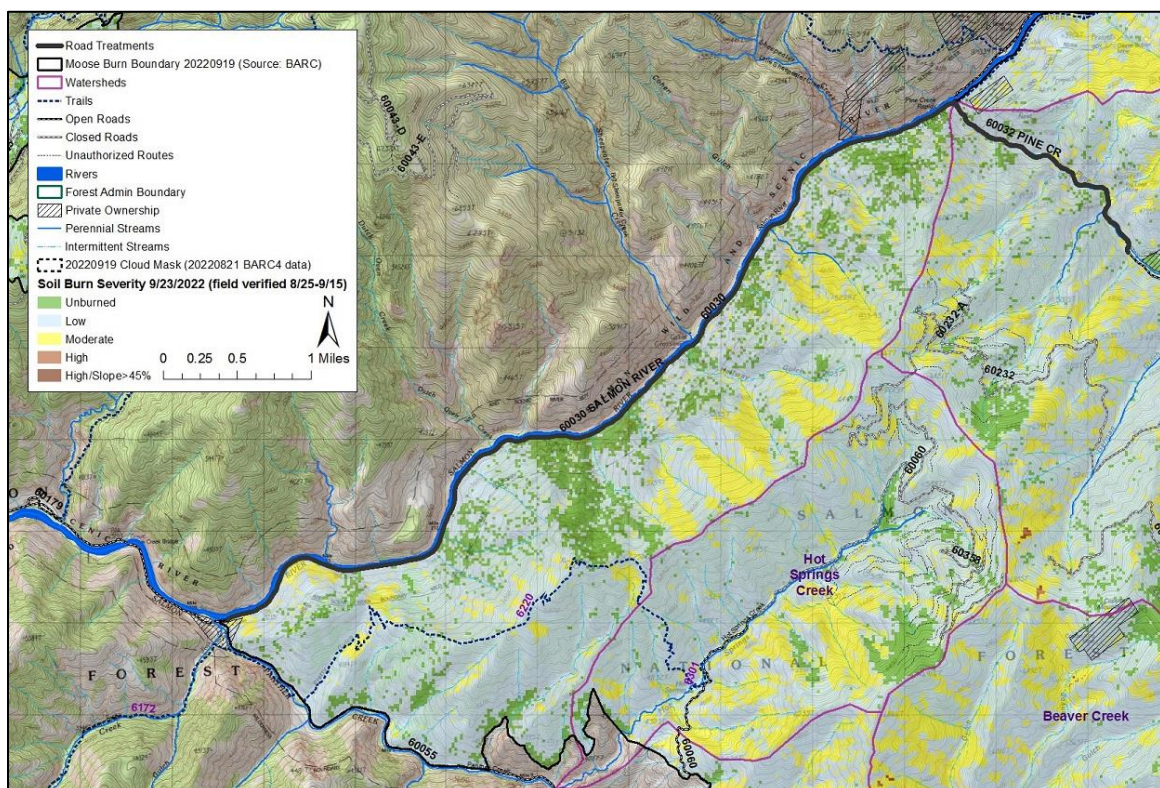
These treatments would be implemented using a combination of SCNF road crew/equipment time and contract. The SCNF would provide equipment and operators for a loader and backhoe. A contract would be required for 3 dump trucks to haul material cleaned from the ditches and catchment basins and transport this material to suitable disposal sites in the vicinity. It is estimated that 80 hours would be needed to complete the project along 13.2 miles of road. At a rate of \$125 per hour for a dump truck, the total contract cost for 3 dump trucks would be \$30,000. BAER funding is requested for these contract costs, but no BAER funding is requested for the SCNF loader and backhoe time and equipment, as this is covered under normal FS salary. These treatments would be implemented in the Spring of 2023.



In the event of storm runoff resulting in a large amount of debris on the roadway, BAER funding could be used to clean out ditches, clean out catchment basins, and reestablish proper drainage to prevent additional damage to the roadway, but otherwise would not be used to clear debris off the roadway other than what is needed to access the site.



Salmon River Road (FR030) segment from Deadwater to Indian Creek, with soil burn severity. The very steep slopes above (North of) the road burned at mostly low severity. This will result in destabilization, rockfall, and debris movement onto the road in the short term.



Salmon River Road (FR030) segment from Pine Creek to Panther Creek, with soil burn severity. The very steep slopes above the road burned at mostly low severity, with moderate severity on the upper slopes. This will result in destabilization, rockfall, and debris movement onto the road in the short term.

### Pine Creek Road (FR60032) Drainage and Stabilization (MOOSE FIRE)

Treatments are recommended along about 1.8 miles of the Pine Creek Road between the Salmon River and the Pine Creek Ranch. This road includes 4 existing bridges and 1 culvert, as well as numerous existing drainage structures (belt deflectors). The risk to this section of road is high because of the potential for high flows or debris flow events, the steep gradient, the low freeboard of the bridges, alignment issues at the crossings, and the narrow canyon and close proximity of the road to Pine Creek.

The following treatments would be implemented:

Bridge #2: 28-foot long wood-deck bridge with 3.5 feet of freeboard (furthest downstream bridge on FR60032). Use available bedrock and local available boulders above the bridges to create a catch point for debris, and build a rolling dip below the road to redirect flows back to the channel in the event that the bridge is overtopped or circumvented.

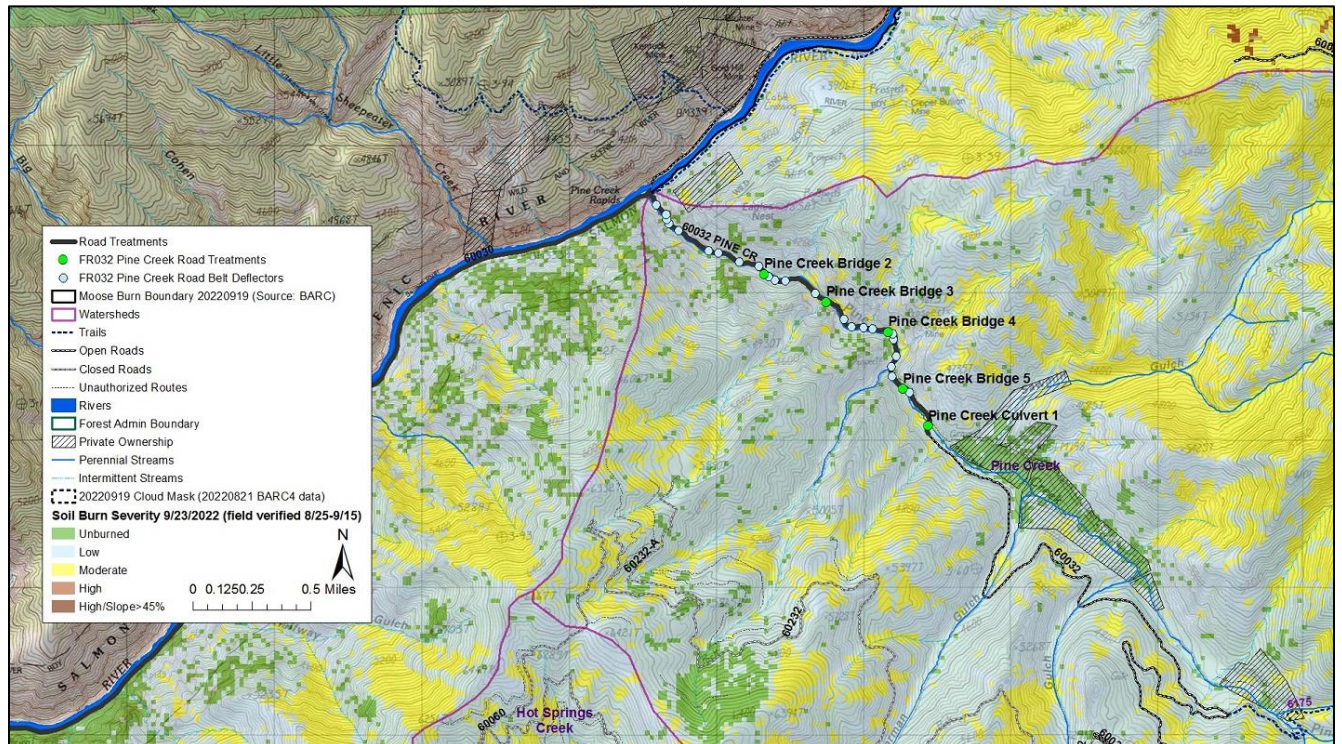
Bridge #3: 28-foot metal I-beam structure with 4 feet of freeboard. With the long potential runout on the road and steep grade it is proposed that three rolling dips be constructed below the bridge to redirect flows back to the channel in the event the bridge is overtopped or circumvented.

Bridge #4: 28-foot long wood-deck bridge with 4 feet of freeboard. Existing rock in the channel could be repositioned to capture and block debris from hitting the bridge. Without adding drainage features, overtopping bridge could erode greater than 600 ft of road. The BAER team recommends outsloping the road approximately 100 feet below the bridge and creating rolling dips where rubber belt deflectors exist now. Out sloping the road where possible along the entire length of the Pine Creek road will allow for shallow sheet flow and will lessen the need for large rolling dip drainage structures.

Bridge #5: 28-foot long wood-deck bridge with 4 feet of freeboard, upstream-most bridge on FR60032. The BAER Team recommended to have the suppression repair crew remove the excess debris from the channel in the 150-200 ft section above the bridge. As a BAER treatment, the team recommends rolling the grade below the bridge and removing a portion of the berm obstructing the swale on the west side of the channel.

Culvert #1: 5-foot diameter culvert under 10-15 feet of cross-valley fill, just downstream of Pine Creek Ranch on FR60032: The BAER team recommends that a spillway type structure be built on the river right side of the culvert fill material. This would entail lowering the grade to create a spill point with a hardened apron down to the stream level. This will act as a relief valve if the culvert is blocked and water is impounded behind the fill material. The team noted a sinkhole feature on top of the fill that may indicate piping around the culvert. This will need to be addressed while onsite.

In addition to these treatments, rolling dips would be constructed along this section of road as needed to control runoff and any spill-over that occurs from Pine Creek as a result of debris jams. In places where the road is too steep to construct a rolling dip, the road would be outsloped as needed, and some existing belt deflectors would be replaced to be more effective in controlling road runoff.



Lower portion of Pine Creek Road (FR032), showing locations of stream crossings and drainage controls where drainage work would be conducted. 16% of the Pine Creek watershed burned at high severity, and 35% burned at moderate severity. These sites are located on the 1.8 mile section of road located downstream of the privately owned Pine Creek Ranch.

These treatments would be implemented using a combination of SCNF road crew and equipment time for a backhoe, and contract for a dozer. It is estimated that this project would require approximately 3 days (24 hours of equipment time) to complete. The contract cost would be approximately \$4100, for 24 hours of dozer time at \$150/hour plus \$500 for mobilization. BAER funding is requested for the contract, but the SCNF operator and equipment time would be funded through normal salary funds. This project would be implemented in March-April of 2023, prior to the first damaging storm event (typically late-summer thunderstorms).

### Wallace Creek Crossing at Stormy Peak Road (FR60023) (MOOSE FIRE)

The Wallace Creek crossing is the highest post-fire risk on the Stormy Peak Road (FR023). With high severity burn in over half of the watershed upstream of the road, it is expected that post-fire storm events will produce high flows, sediment, and debris mobilization. Excessive downed woody debris in the Wallace Creek channel upstream of the crossing as a result in of the fire may also lead to the potential for channel migration across this relatively wide (>300-foot) valley at the road crossing.

The following tasks will be implemented at this site. These will be implemented under a contract.

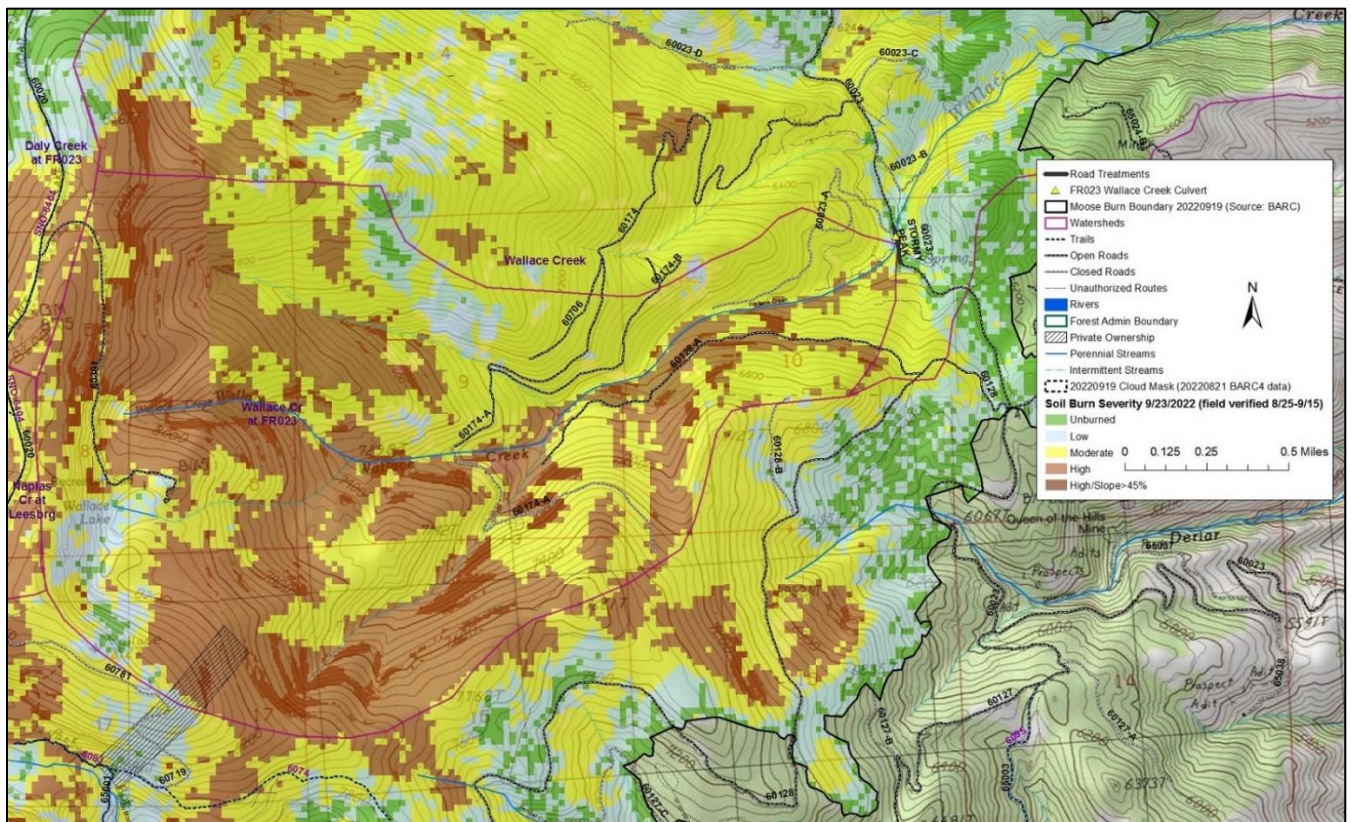
- The existing 35-inch by 24-inch culvert at the Wallace Creek crossing of FR023 will be replaced with a 57-inch by 38-inch squash pipe (48-inch round pipe equivalent) on the original pipe grade to better accommodate post-fire runoff, flood events, and debris. This size pipe is the largest that can feasibly be installed in the road bed material at this location. Approximately 2 feet of fill (roughly 100 to 110 yards of material, commercial source) will be added to the road bed over the top of the pipe, with tapers grading into the existing road bed. One or more rock grade control structures will be constructed below the culvert outlet to stabilize the channel, prevent scour at the outlet, and provide energy dissipation during high flow events. No fish are present in this section of Wallace Creek because of high gradients upstream and downstream. The primary goal of this project is high flow passage, and Aquatic Organism Passage is not required.

- The inside ditch along this section of FR023 will be cleaned out to accommodate any additional flow, and a ditch block will be constructed out of rock and fill just north of the Wallace Creek Crossing to route flow through the culvert. This ditch block will be tied into higher topography to the north to route any dynamic channel movement towards the culvert. The partially smashed 12-inch culvert in this ditch at the “driveway” of an unauthorized road just north of the Wallace Creek crossing will be removed to allow this section of ditch to function unimpeded.
- The damaged inlet of an existing relief culvert under FR023 south of the Wallace Creek crossing will be opened using a hydraulic jack in order to restore proper function to that culvert.

Estimated contract costs include the following:

Materials	\$4778
Mobilization	\$720
Equipment	\$867
Haul	\$1281
Labor	\$555
De-watering (Temporary pipe, equipment, materials, and labor)	\$2000
<b>TOTAL</b>	<b>\$10,210</b>

This project would be implemented as soon as possible in 2023, prior to the first damaging storm event (typically late-summer thunderstorms).



Map of Wallace Creek watershed at the Stormy Peak Road (FR023), with soil burn severity. 52% of the watershed burned at high severity, and 42% burned at moderate severity. The Wallace Creek culvert and the portion of the Stormy Peak Road where drainage work would be conducted are shown.

Emergency Trail Stabilization/Storm-proofing (MOOSE FIRE)

Based on an analysis of the burn severity within the Moose Fire burn area and slope data, the trails listed in the table below have been identified as being “at risk” from post-fire flooding, erosion, or debris flows and the forest will have the capacity to work on these trails early in the 2023 season. The

segments identified for project work are those within or downslope from areas burned at moderate and/or high severity, particularly on steep slopes, based on the burn severity mapping.

Drainage features will be constructed, and stabilization measures taken on trails that have a high risk of loss or damage due to increased runoff expected within the first year following fire. Previous fires on the Salmon-Challis NF have shown that moderate and high burn severity areas have a high potential to impact existing trail systems. Treatments are proposed to reduce unacceptable risks within high severity burned areas and steep slopes burned at moderate and high severity.

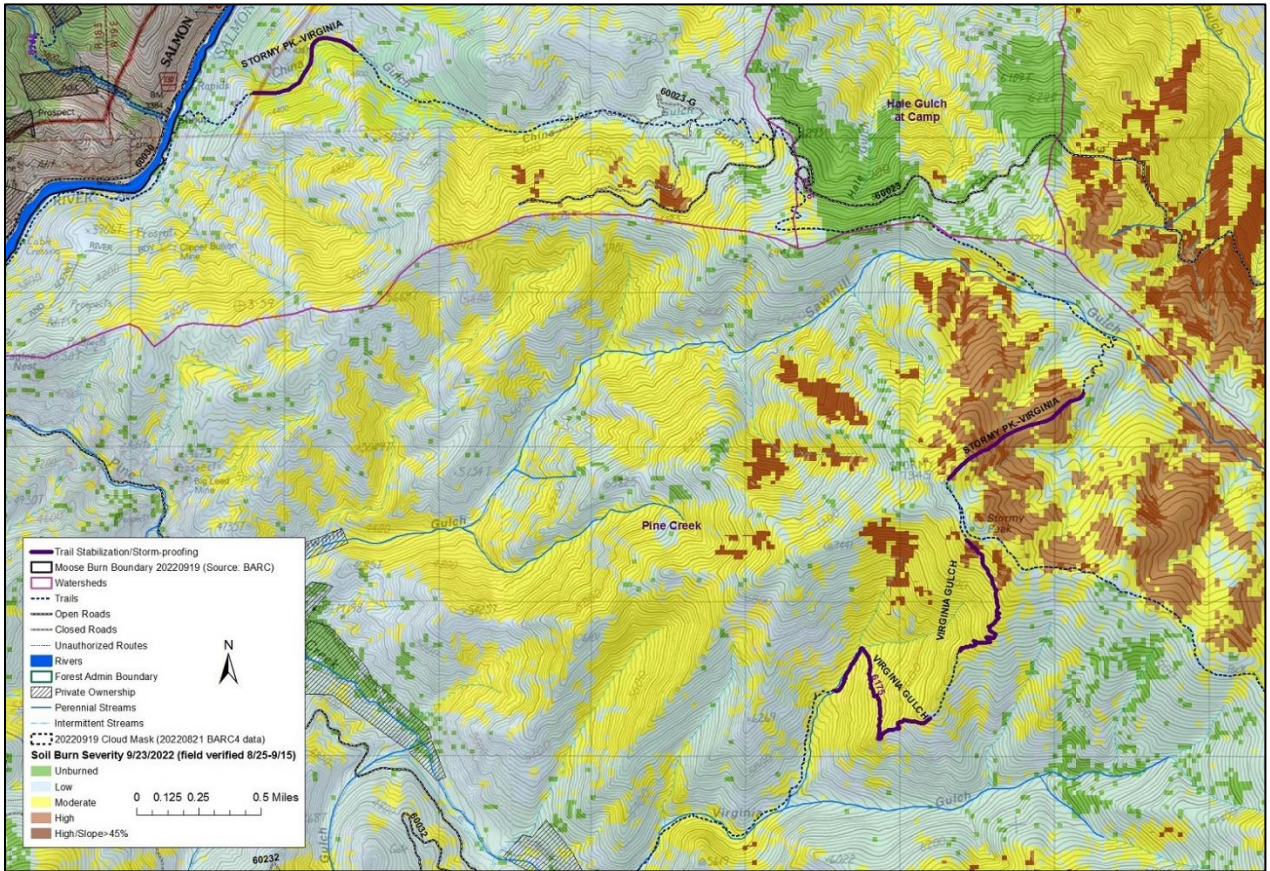
Trail stabilization project work identified within the Moose Fire burn area is for approximately 6.7 miles of trail on 6 different trail segment and the proposal is to utilize a partnership agreement with a youth conservation corps for 2 hitches to work on the non-motorized trails. A youth conservation corps costs approximately \$12,000 per hitch and a hitch consists of 8 days. For the motorized trails and an existing agreement with Idaho Parks and Recreation (IDPR) will be used. The IDPR trail cat and operator cost \$782.64 per day with 5 days anticipated. IDPR's ATV trail crew cost \$682.92 per day with 5 days anticipated. Total cost requested from BAER funding for Trail Stabilization is approximately \$31,327.

TRAIL #	TRAIL NAME	MILES	DESIGNATION	PARTNERSHIP AGREEMENT	FUNDING AMOUNT
#6175	Virginia Gulch Trail	1.6	Non-motorized	Youth conservation corps	\$24,000
#6176	Stormy Peak-Virginia Trail	1.2	Non-motorized	Youth conservation corps	
#6067	Hornet Creek Trail	0.5	Motorized	IDPR Agreement	\$7,328
#6076	Daly Creek	1.4	Motorized	IDPR Agreement	
#6065	Moose Creek Driveway	1.5	Motorized	IDPR Agreement	
#6064	Coffee Gulch	0.5	Motorized	IDPR Agreement	
	<b>TOTAL</b>	<b>6.7</b>			<b>\$31,327</b>

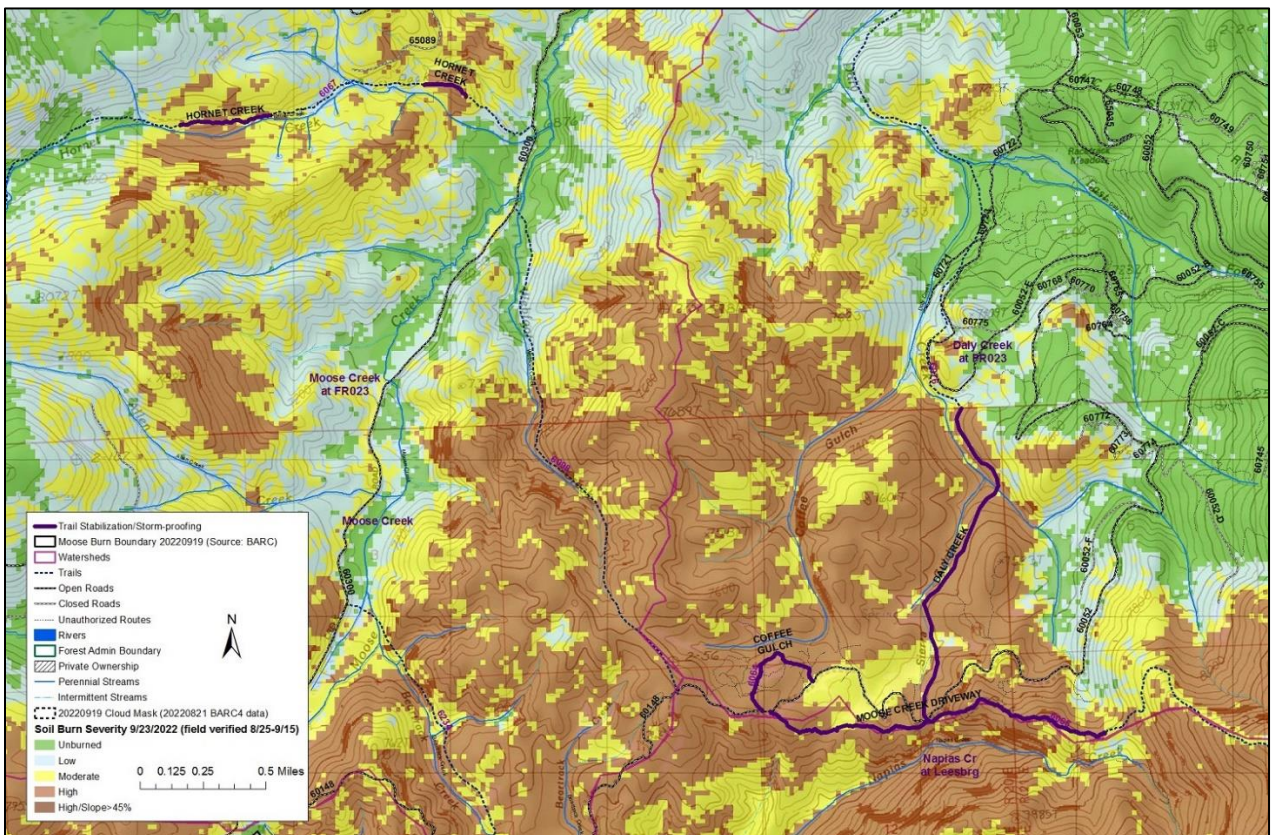
The trail work will be implemented on trails lacking adequate drainage features for anticipated increased runoff by field crews using appropriate equipment and will include construction of wood and rock water bars, dip-drains, and rolling dips, as well as armoring of stream/drainage crossings. The work will follow Forest Service trail specifications, and the proposed trail work will be the minimum required to prevent serious erosion and/or loss of the trail infrastructure. Treatments will follow design specifications in the Burned Area Emergency Response Treatments Catalog (USDA Forest Service, 2006). The number of structures to be constructed will depend on burn severity, soil type, trail slope, and topography. Drainage structures will not be required along the entire length of each of these trail segments, however we expect the need for a significant number of drainage structures due to the steep slopes and fire severity.

All of the trail work will be completed by August 2023, with the expectation that the trails would be stabilized prior to the high magnitude thunderstorms that typically occur in the late summer.

BAER funds would be used only to complete the work described above to reduce unacceptable risk to trail infrastructure as a result of the fire. In conjunction with BAER funds, other sources of funding (salary for Forest trails personnel, other grants, etc) will be used to address ongoing trail maintenance, trail clearing, and oversight of the BAER work.



Map of proposed trail treatments on non-motorized trails (Virginia Gulch and Stormy Peak-Virginia Trails), with soil burn severity.



Map of proposed trail treatments on motorized trails (Hornet Creek, Daly Creek, Moose Creek Driveway, and Coffee Gulch Trails), with soil burn severity.

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## **Protection/Safety Treatments:**

### Hazard Warning Signs (MOOSE FIRE)

Hazard warning signs will be placed at the following locations to warn visitors of hazards associated with the burned area:

- FR60023 (Stormy Peak Road) near Deriar Creek
- FR60300 (Moose Creek Road) near Rapps Creek
- FR60032 (Pine Creek Road) near junction with Salmon River Road
- FR60020 (Ridge Road) near top of Jesse Creek

The cost of signs and installation is shown below:

- Road signs: 4 @ \$150 each
- Road sign installation (labor): 4 @ \$150 each
- Total estimated cost: \$1200

No hazard warning signs are proposed for the Owl Fire at this time.

### Advanced Warning Systems (MOOSE FIRE)

The Salmon-Challis National Forest will provide assistance to the National Weather Service to implement an advanced warning system in order to alert nearby residents of weather conditions that may imminently lead to floods and/or debris flows. No BAER funding is requested for this.

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## **Heritage and Cultural Resource Treatments:**

### Heritage and Cultural Site Protection (MOOSE FIRE)

Installation of signage to inform and deter visitors from unauthorized artifact collection or otherwise engaging in site damaging activities. Locally available vegetative camouflage may be utilized to obscure artifact or feature visibility on site if needed and as determined by USFS Archaeologist. Following these treatments ongoing site monitoring and condition assessments are recommended to ensure treatments are effective.

Treatment objectives to mitigate the Heritage Resources emergency include reducing the likelihood that sites will be subjected to looting and vandalism due to an increased visibility of artifacts and features and ensuring that the implementation of treatments designed to mitigate other natural resource concerns do not negatively impact the NRHP values of eligible properties.

Specific protection measures designed to reduce the probability of looting for selected artifact deposits include installation of signage to educate visitors on the protected status of the property and the illegality of unauthorized damage or removal of artifacts or features of the site. In addition, use of locally available vegetative camouflage may be installed to obscure visibility of artifacts on the surface. Following these treatments, ongoing site monitoring will be necessary to evaluate the effectiveness of treatment methods. Monitoring would consist of periodic site visits (at least 2) throughout the upcoming year to monitor site condition and assess whether or not evidence of unauthorized artifact collection or damage is present.

Heritage Resource protection measures applicable to the implementation of proposed treatments activities associated with other resources (e.g. watershed) which occur within archaeological site boundaries may include on-site monitoring by a qualified USFS Archaeologist during implementation.

*Heritage Resource Treatment Costs*

<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
GS-9 Archaeologist	Days	\$300	3	\$900
Materials (Signs)	Box	\$250	1	\$250
			<b>Total Cost:</b>	<b>\$1150</b>

**I. Monitoring Narrative:**

No BAER funding for monitoring is requested at this time.



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

**MOOSE FIRE**

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>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>B. Channel Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>C. Road and Trails</b>										
Salmon River Road Ditch and Catchment Basin Cleanout	Contract	30,000	1	\$30,000	\$0		\$0		\$0	\$30,000
Pine Creek Road Drainage and Stabilization	Contract	4,100	1	\$4,100	\$0		\$0		\$0	\$4,100
Wallace Creek Crossing at Stormy Peak Road	Contract	10,210	1	\$10,210	\$0		\$0		\$0	\$10,210
Trail Stabilization /Storm-Proofing - Non-motorized Trails	Agreement	24,000	1	\$24,000	\$0		\$0		\$0	\$24,000
Trail Stabilization /Storm-Proofing - Motorized Trails	Agreement	7,328	1	\$7,328	\$0		\$0		\$0	\$7,328
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road and Trails</i>				\$75,638	\$0		\$0		\$0	\$75,638
<b>D. Protection/Safety</b>										
Hazard warning signs	Signs	300	4	\$1,200	\$0		\$0		\$0	\$1,200
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				\$1,200	\$0		\$0		\$0	\$1,200
<b>Heritage/Cultural</b>										
Heritage/Cultural Site Protection	Each	1,150	1	\$1,150	\$0		\$0		\$0	\$1,150
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				\$1,150	\$0		\$0		\$0	\$1,150
<b>E. BAER Evaluation</b>										
Initial Assessment	Report	\$19,000	1	---	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				\$0	\$0		\$0		\$0	\$0
<b>F. Monitoring</b>										
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$0	\$0		\$0		\$0	\$0
<b>G. Totals</b>				\$77,988	\$0		\$0		\$0	\$77,988
Previously approved										
Total for this request				\$77,988						

### OWL FIRE

Line Items	Units	Unit Cost	# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	Total \$
<b>A. Land Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>B. Channel Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>C. Road and Trails</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road and Trails</i>				\$0	\$0		\$0		\$0	\$0
<b>D. Protection/Safety</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				\$0	\$0		\$0		\$0	\$0
<b>E. BAER Evaluation</b>										
Initial Assessment	Report			---	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				\$0	\$0		\$0		\$0	\$0
<b>F. Monitoring</b>										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$0	\$0		\$0		\$0	\$0
<b>G. Totals</b>										
Previously approved				\$0	\$0		\$0		\$0	\$0
Total for this request				\$0	\$0		\$0		\$0	\$0

### PART VII - APPROVALS

1. Heidi Quicker  
Forest Supervisor

10/28/22  
Date