

Date of Report: 11/16/2020

**BURNED-AREA REPORT**  
**AUGUST COMPLEX (NORTH AREA)**



**PART I - TYPE OF REQUEST**

**A. Type of Report**

1. Funding request for estimated emergency stabilization funds

**B. Type of Action**

2. Interim Request #2 - AUGUST COMPLEX - NORTH PART. This current request covers approximately the northern half of the August Complex less the initial funding for Shasta-Trinity and Six Rivers National Forests.

Two prior 2500-8 requests were submitted for the August Complex:

INITIAL REQUEST: For the WHOLE AUGUST COMPLEX. Submitted and approved for \$500,000, of storm proofing and storm patrol.

INTERIM REQUEST 1: For the AUGUST COMPLEX-SOUTH PART. Submitted and approved for \$1,451,929.

**PART II - BURNED-AREA DESCRIPTION****A. Fire Name: August Complex****B. Fire Number: CA-MNF-000753****C. State: CA****D. County: Glenn, Humboldt, Mendocino, Tehama, Trinity****E. Region: 5****F. Forest: MNF, SHF, SRF****G. Districts: all****H. Fire Incident Job Code: P5NFP4****I. Date Fire Started: 8/16/2020****J. Date Fire Contained: 93% to date****K. Suppression Cost: \$230,900,000 to date**

**The following description applies to the NORTH PART of the AUGUST COMPLEX**

**L. Fire Suppression Damages Repaired with Suppression Funds:**

1. Fireline repaired (miles): 342
2. Handline repaired (miles) 40

**M. Watershed Numbers:****Table 1: Acres Burned by Watershed (North Assessment Area)**

HUC 10	HUC 10 Name	Total Acres	Unburned	%	Low	%	Moderate	%	High	%
1802015201	Beegum Creek	56,916	52,770	92.7%	2,123	3.7%	1,611	2.8%	413	0.7%
1801010401	Black Butte River	103,594	103,589	100%	3	0.003%	2	0.002%	0	0%
1801010504	Chamise Creek-Eel River	125,980	112,503	89.3%	9,284	7.4%	3,519	2.8%	675	0.5%
1802015205	Cold Fork	39,335	30,355	77.2%	2,615	6.6%	6,307	16.0%	57	0.1%
1801010503	Dobbyn Creek	47,925	47,224	98.5%	348	0.7%	216	0.5%	137	0.3%
1802015206	Dry Creek	97,753	97,633	100%	77	0.1%	43	0.0%	0	0%
1802015602	Elder Creek	88,374	88,369	100%	5	0.006%	0	0%	0	0%
1802011503	Grindstone Creek	110,115	110,115	100%	0	0%	0	0%	0	0%
1801010405	Lower Middle Fork Eel River	109,532	104,993	96%	2,579	2.4%	1,937	1.8%	24	0.02%
1802015207	Lower South Fork Cottonwood Creek	51,938	42,737	82.3%	1,778	3.4%	7,276	14%	146	0.3%
1801010203	Middle Mad River	56,462	56,204	99.5%	254	0.4%	5	0.01%	0	0%
1801021204	Middle South Fork Trinity River	145,690	119,037	81.7%	14,662	10%	8,851	6.1%	3,141	2.2%
1801010501	North Fork Eel River	180,857	100,629	55.6%	34,425	19%	37,025	20.5%	8,778	5%
1802015503	Red Bank Creek	70,655	61,853	87.5%	2,075	3%	6,676	9.4%	51	0.1%
1801021202	Upper Hayfork Creek	105,626	105,448	99.8%	101	0.1%	70	0.1%	7	0.01%
1801010202	Upper Mad River	77,107	15,361	19.9%	16,014	20.8%	27,578	35.8%	18,154	23.5%
1801010402	Upper Middle Fork Eel River	131,154	54,802	41.8%	38,567	29.4%	31,642	24.1%	6,143	4.7%
1802015204	Upper South Fork Cottonwood Creek	64,908	34,176	52.7%	14,782	22.8%	15,586	24.0%	364	0.6%
1801021201	Upper South Fork Trinity River	73,618	31,504	42.8%	18,137	24.6%	17,832	24.2%	6,146	8.3%
1802015604	Upper Thomes Creek	118,075	118,043	100%	21	0.02%	11	0.01%	0	0%
1801010507	Upper Van Duzen River	54,646	48,061	88%	3,820	7%	2,388	4.4%	377	0.7%

**N. Total Acres Burned: 1,032,649 (as of 11/04/2020)****Acres of North Assessment Area: 551,493 acres***Table 2: Total Acres Burned by Ownership*

<b>OWNERSHIP</b>	<b>ACRES</b>
MENDOCINO NF	142,411
SHASTA-TRINITY NF	149,497
SIX RIVERS NF	144,330
<b>TOTAL NFS</b>	<b>436,237</b>
BIA	431
BLM	22,340
STATE	619
PRIVATE	91,866
<b>TOTAL</b>	<b>551,493</b>

**O. Vegetation Types:****Vegetation Community Types affected by the August Complex Fire, North Zone**

<b>Vegetation Type</b>	<b>Acres</b>	<b>Percent</b>
Blue oak - digger pine	22055	2.2%
California black oak	25004	2.5%
California coast live oak	5036	0.5%
California cypress	61	0.0%
California mixed subalpine	1382	0.1%
Canyon live oak	36184	3.5%
Cottonwood - willow	514	0.1%
Hard chaparral	123099	12.1%
Jeffrey pine	7659	0.8%
Knobcone pine	6355	0.6%
Lodgepole pine	15	0.0%
Non-forest	46613	4.6%
Non-native hardwood forest	23	0.0%
Oregon white oak	38819	3.8%
Pacific Douglas-fir	207812	20.4%
Pacific ponderosa pine	23476	2.3%
Pacific ponderosa pine - Douglas-fir	111746	11.0%
Red alder	31	0.0%
Red fir	29066	2.9%
Sierra Nevada mixed conifer	232810	22.8%
Western juniper	84	0.0%
Western white pine	4788	0.5%
White fir	96780	9.5%

**P. Dominant Soils:**

Generally, the soils are as varied as the complex geology of the fire area and no soils are dominant. However, during the assessment, two areas came into focus as areas of concern. The primary focus was the Upper Mad River drainage and the South Fork Trinity River.

**Upper Mad River.** The watershed above Ruth Lake is dominated by different terranes of the Franciscan Mélange. Generally, the surface texture of this assemblage is non-skeletal loam soils. There is little resistance to rill formation and are somewhat erodible soils that deliver significant fine soil (silt and clay) to the water conveyance system. The primary soil map units in the Upper Mad River watershed are:

Map Unit Name	Surface Texture	Acres
Skalan-Kristirn-Holland families association, deep, 35 to 70 percent slopes	Very gravelly loam	18502
Clallam-Hugo-Holland families association, deep, dry, 35 to 70 percent slopes	Very gravelly loam	13427
Clallam-Hugo-Holland families association, deep, 35 to 70 percent slopes	Very gravelly loam	9463
Clallam family, moderately deep, unstable-Melbourne family, deep association, 35 to 70 percent slopes	Gravelly loam	7318

**South Fork Trinity River**, above Hayfork Creek. This watershed has several geologic terranes associated with accretion wedges during the convergence of tectonic plates. The primary terranes are the Rattlesnake and Pickett Peak. The soils tend to be derived from mafic rock that produce higher clay content and more unstable soils. Although the soils will have good aggregate stability when not burned with high soil burn severity, burned soils are likely to produce significant amounts of the fine soil fraction (silt, clay). This area did not have widespread impacts to the soils within the watershed, but there were some localized subwatersheds with high burn severity. This is a concern because of the importance of the river anadromous fish habitat. The map units are dominated by Neuns and Holland soils.

Map Unit Name	Surface Texture	Acres
Skalan-Kristirn-Holland families association, deep, 35 to 70 percent slopes	Very gravelly loam	18502
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## Q. Geologic Types:

The northern half assessment area of the August Complex fire area lies within the Klamath Mountains Physiographic Province and is underlain predominantly by Paleozoic and Mesozoic metavolcanic and metasedimentary rock, along with minor amounts of Tertiary and Quaternary sediments. Tectonic processes have created sedimentary formations and plutons and have accreted numerous terranes to the western margin of North America. Seven of these distinct geologic bodies occur within the fire area: The Redding Formation, Rattlesnake Creek, Western Klamath, Pickett Peak, Yolla Bolly, and Central Belt Franciscan Terranes, and the Coast Range Ophiolite (Table 2).

**Table 2: Rock Units within the August Complex North Assessment Area**

Belt/Assemblage	Age	Terrane/Formations	Rock type
Cretaceous Overlap	Jurassic / Cretaceous	Great Valley Group / Redding Formation	Sedimentary, Fluvial, Marine, Alluvium/Lacustrine
Pleistocene Alluvial Deposits	Quaternary	Superjacent to All Areas	Sedimentary, Alluvium/Colluvium
Western Paleozoic & Triassic	Triassic	Rattlesnake Creek	Metavolcanics plus Metasediments, Peridotite
Western Paleozoic & Triassic	Triassic to Late Cretaceous	Western Klamath Pickett Peak	Metavolcanics, Metasediments, Micaceous

		Yolla Bolly	Schist, Metagraywacke, Chert, Peridotite, Serpentinite
Mesozoic Franciscan Assemblage	Jurassic / Cretaceous	Central Belt Franciscan	Greenstones, Chert, Sandstone, Greywacke, Limestone, Serpentinite, Shale
Plutons	Jurassic	Intrude the Rattlesnake Creek and Pickett Peak	Intrusive igneous, Intermediate to Mafic Diorite, Granodiorite, Gabbro, Pyroxenite, Amphibolite

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

*Miles of Stream Channels by Order or Class*

STREAM TYPE	MILES OF STREAM
PERENNIAL	711
INTERMITTENT	1,235
EPHEMERAL	3,721
OTHER (DEFINE)	-

**S. Transportation System:**

**Trails:** *National Forest (total miles): 303      Other (miles): -*

Mendocino NF (miles): 148

Shasta-Trinity NF (miles): 106

Six Rivers NF (miles): 49

**Roads:** *National Forest (total miles): 1,064 (ML1+)      Other (miles): 93*

Mendocino NF (miles): 169

Shasta-Trinity NF (miles): 439

Six Rivers NF (miles): 456

**PART III - WATERSHED CONDITION****NORTH PART – AUGUST COMPLEX****A. Burn Severity (acres):**

<b>Soil Burn Severity (by Ownership)</b>	<b>Acres</b>	<b>Percentage Burned</b>
<b>High</b>	<b>44,613</b>	<b>8.1%</b>
Mendocino National Forest	5,918	1.1%
Shasta-Trinity National Forest	9,353	1.7%
Six Rivers National Forest	23,898	4.3%
TOTAL FOREST SERVICE	39,169	7.1%
Bureau of Indian Affairs	19	0.003%
Bureau of Land Management	1,863	0.3%
State	0.4	0.0001%
Other Owners	3,562	0.6%
<b>Moderate</b>	<b>168,575</b>	<b>30.6%</b>
Mendocino National Forest	35,076	6.4%
Shasta-Trinity National Forest	37,949	6.9%
Six Rivers National Forest	52,856	9.6%
TOTAL FOREST SERVICE	125,881	22.8%
Bureau of Indian Affairs	146	0.03%
Bureau of Land Management	10,446	1.9%
State	223	0.04%
Other Owners	31,879	5.8%
<b>Low</b>	<b>161,670</b>	<b>29.3%</b>
Mendocino National Forest	44,414	8.1%
Shasta-Trinity National Forest	41,307	7.5%
Six Rivers National Forest	34,351	6.2%
TOTAL FOREST SERVICE	120,072	21.8%
Bureau of Indian Affairs	203	0.04%
Bureau of Land Management	5,586	1%
State	242	0.04%
Other Owners	35,567	6.4%
<b>Unburned / Very Low</b>	<b>176,634</b>	<b>32%</b>
Mendocino National Forest	57,003	10.3%
Shasta-Trinity National Forest	60,888	11%
Six Rivers National Forest	33,225	6%
TOTAL FOREST SERVICE	151,116	27.4%
Bureau of Indian Affairs	63	0.01%
Bureau of Land Management	4,444	0.8%
State	153	0.03%
Other Owners	20,858	3.8%
<b>GRAND TOTAL</b>	<b>551,493</b>	

High and Moderate Burn Severity is concentrated in a few areas of the August Complex – North Part. It is concentrated in particular in the Upper Mad River above Ruth Lake reservoir, and to a lesser extent in the Upper South Fork Trinity River, Upper Middle Fork Eel River, and North Fork Eel River. The amount of high soil burn severity in the Upper Mad River stands out at 23.5%.

<b>August Complex – NORTH</b>	<b>Acres</b>	<b>High SBS (%)</b>	<b>Moderate SBS (%)</b>	<b>High + Moderate (%)</b>
Whole NORTH	551,493	8.1	30.6	38.7
Upper Mad River	77,107	23.5	35.8	59.3
Upper South Fork Trinity	73,618	8.3	24.2	32.5
Upper Middle Fork Eel	131,154	4.7	24.1	28.8
North Fork Eel	180,857	5.0	20.5	25.5

Refer to Appendix A for Soil Burn Severity maps of the August Complex-North Part and the Upper Mad River watershed.

**B. Water-Repellent Soil (acres):** Approximately 75 percent of soils with moderate to high soil burn severity had moderate to strong water repellency. This equates to about 63,9573 acres for the burn area. There is an estimated 75% extent of increased severity of background water repellency that would accelerate runoff during the first runoff event. As successive storms precipitate on the fire, this extent will rapidly decrease as the soil wetting overcomes water repellency.

**C. Soil Erosion Hazard Rating:** The erosion hazard rating (EHR) for the August Fire was calculated using the USFS region 5 EHR system, which uses soil texture, aggregate stability, climate, hillslope gradient, hillslope length, and a soil cover and quantity rating. For many of the soils within the burned area, the aggregate stability value was increased to 1 to account for the high percentage of gravels in the surface horizon and strong soil strength which slightly lowers the calculated EHR for those soil types.

Erosion Hazard Rating		
Rating	Acres	Percent
Low	338,304	61
Moderate	138,514	25
Severe	74,675	14
Total	551,493	100

**D. Erosion Potential:**

Over 60% of the soil burn severity either burned low or did not burn. The erosion potential in these burn severities is well within soil loss tolerance levels. During the assessment, two watersheds were identified as high risk for excessive erosion delivery; South Fork Trinity River and Upper Mad River.

The ERMiT, a model developed in the FS Water Erosion Prediction Program (WEPP), was used to estimate erosion potential. These were modeled at a 5-year erosion event. The values are:

Upper Mad River: 16.9 tons/acre

South Fork Trinity River @ Hayfork Creek: 4.8 tons/acre

South Fork Trinity River @ Forest Glenn: 7.4 tons/acre

The upper watershed of Upper Mad River experienced heavy canopy combustion. The burn happened at all landscape positions eliminating the potential of riparian filtering.

The South Fork of the Trinity River (SFT) at Forest Glenn appears to have a relatively high erosion rate. However, the high soil burn severity occurs in more of a mosaic except for a few localized areas such as Texas Chow and Rough Creek. As you move downstream along SFT to Hayfork, the erosion potential drops of considerably due to a greater percentage of the watershed being burned. Refer to Appendix A for Soil Erosion Potential maps of the August Complex-South Fork Trinity and the Upper Mad River watershed.

**E. Sediment Potential:**

Sediment potential is difficult to estimate. Some professionals use a delivery ratio, but that was not a value that was estimated. Because there is very little low severity or unburned soil within the upper watershed of Upper Mad River and there is no intact riparian vegetation to act as a filter, the sediment delivery will be high. Relative to the Ruth Reservoir

however, the long reach of very low gradient creek between the burn and the reservoir will act as a depositional reach for lower flow events.

The South Fork Trinity will have very high sediment yields in localized areas. Depending on the flow of the main stem, this may or may not be significant but will certainly affect the SFT in segments of the river. The main stem of the SFT has a very wide unburned riparian buffer and the watershed is a mosaic of burn severities. This will certainly help mitigate sediment deposition from hillslopes that are not associated with sub-watersheds with a high proportion of moderate and high soil burn severities.

## F. Estimated Hydrologic Response:

Due to the underlying geology of the Coast Range, many of these watersheds have a very high suspended sediment yield (e.g. bedrock, boulders, cobbles, and gravel) which deposits in the lower gradient reaches of the watersheds. In addition, much of the bedrock within region has produced unstable soils which are subject to slumping and erosion. The climate of the region is Mediterranean with hot, dry summers and cool, wet winters. The burned area receives almost all of its precipitation during the five-month period of November through March. The west side of the burned area generally receives more annual precipitation than the east side.

The watershed response of the August Complex Fire North Zone is 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) flooding with increased peak flows and sediment deposition, and 4) increased suspended sediment that will extend beyond the fire perimeter. These responses are expected to be most evident during initial storm events immediately after the fire. Thereafter, responses are expected to become less evident as vegetation reestablishes, providing ground cover, increasing surface roughness, and stabilizing and improving the infiltration capacity of the soils. Watersheds composed of more high severity burn such as the Upper Mad River watershed can expect these post-fire effects to be magnified.

Streamflow is expected to increase post fire during the vegetation recovery period, with the largest flow increase expected in the first year after the fire. The upstream watershed burn severity was used to assess potential changes to flow at specific locations where critical values were potentially at risk. Regional regression methodology was applied for critical value upstream watersheds for two-year flow events. A two-year storm has a 50% chance of occurring in any given year. The hydrology specialist report includes detailed information on the methodology and modeled results for streamflow in and downstream of burned areas. The following table shows pre-fire and post-fire streamflow estimates using 2-year return interval.

Critical Values Pour Point Watersheds	Drainage size (acres)	Q(5)		Magnitude of Post-Fire streamflow increase (Post-fire/Pre-fire)
		Pre-Fire Discharge	Post-Fire Discharge	
Cold Fork	25,389	2059	2889	1.40
Low Bridge	29,017	3491	7252	2.08
Middle Beegum	2,497	331	598	1.81
Middle Eel	131,173	23264	30524	1.31
North Fork Eel	140,931	28724	38158	1.33
Ruth Lake	63,534	7067	13436	1.90
Ruth Lake Gaging Station	59,897	6691	12779	1.91
Ruth Lake Reservoir	77,139	8435	15432	1.83
South Fork Cottonwood	77,944	6424	9524	1.48
South Fork Trinity	135,491	14858	21794	1.47
Culvert 1	1,440	238	456	1.92
Bierce Creek	3,832	610	1174	1.92
Salt Creek	15,546	1729	3121	1.81
Rough Gulch	3,210	562	1115	1.98

This table show upper Mad River gaging (Ruth Lake Reservoir, Ruth lake Gaging Station, and Low Bridge) showed the highest watershed response of about double normal flows. Refer to Appendix A for Watershed Runoff map of the August Complex-North.

#### **G. Debris flow Probability:**

In order to assess the probability and potential volumes of debris flows in the burned area the assistance of the US Geological Survey (USGS) - Landslide Hazards Program was obtained. Their ongoing research has developed empirical models for forecasting the probability and the likely volume of such debris flow events. To run their models, the USGS uses geospatial data related to basin morphometry, burn severity, soil properties, and rainfall characteristics to estimate the probability and volume of debris flows that may occur in response to a design storm (Staley, 2016). Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 12 – 40 millimeters per hour (mm/h) rate. After receiving the final August complex soil burn severity map, the USGS conducted a debris flow assessment of the fire area that presented debris flow hazard classes, probability of occurrence, and volumes of materials occurring for multiple precipitation events.

Based on this model it appears that under conditions of a peak 15-minute rainfall intensity storm of 24 millimeters per hour (0.94 inch/hr.), the probability of debris flows occurring is high to very high (60-80% and 80-100%) in some channels and watershed in the burn area. Some of these high-risk watersheds include Upper Mad River, South Fork Trinity River, portions of Middle and North Fork Eel River, and South Fork Cottonwood Creek. Under these same conditions and in these same drainages, predicted volumes of debris flows are expected to range from 1K-10K cubic meters in some drainages and 10K-100K cubic meters in other drainages. From the debris flow combined hazard map it appears that the majority of these creeks mentioned above are predicted to produce debris flows of a moderate to high combine hazard. Refer to Appendix A for Debris Flow Potential map of the August Complex-North watersheds.

#### **H. Estimated Vegetative Recovery Period (years):**

It is anticipated that vegetative recovery will be between 1 and 5 years. Different vegetative recovery rates will occur for different vegetation communities, chaparral is anticipated to recover more quickly than mixed conifer types, for example. Flood potential will decrease as vegetation reestablishes, providing ground cover, increasing surface roughness, and stabilizing and improving the infiltration capacity of the soils.

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

**Introduction/Background:** In the midst of an excessive heat event, several rounds of dry thunderstorms tracked across the region during the August 16th-18th time frame. Over 6,000 cloud-to-ground lightning strikes were recorded in CA, including 1,463 strikes across interior NorCal. These lightning strikes started hundreds of wildfires across the region including the August Complex fires. On September 11, 2020, the fires known as the Elkhorn, Hopkins, Willow, Vinegar and the August Complex were combined into one unit collectively designated as the August Complex.

On September 24, two BAER teams (North and South) begin assessments. Within days, due to restricted access, the North Team was put on hold. The South Assessment continued, with some North team members joining, to produce the Interim 2500-8 #1. The North Team resumed assessment on October 14 and prepared Interim 2500-8#2.

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

*Table 3: Critical Value Matrix*

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

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

Forest Visitors Safety and use of the Transportation System: The existing environment within the North Zone of the August Complex perimeter consists of a mosaic of fire-killed and defective trees along open National Forest System Roads, as well as county, state and roads under special use permits that access high-value energy infrastructure corridors. This change in forest conditions as a result of the fire has significantly increased the risk to human life due to diminished forest structural integrity. Probability of damage is possible, and magnitude of consequences is moderate, so risk is intermediate.

Recreational facilities as well as numerous trailheads have also been impacted by the fire to varying degrees. Hazards associated with the fire-killed and damaged trees will need to be abated (including removal where substantial debris exists) prior to opening facilities to the public.

Hazmat Stabilization at Burned Rec Residences and Administrative Compounds: Burned buildings, cabins, barracks, shops, equipment storage sites that burned pose a hazmat threat due to burned and released chemicals mixing with gas and oil along with building materials creating a toxic cocktail that is readily mobile. This toxic brew of chemicals could be easily mobilized with heavy rains into creeks that feeds into the South Fork Trinity River and Middle Eel River which is a major watershed for water quality and T&E listed fisheries. Areas affected on the Shasta-Trinity National Forest are Forest Glenn Recreational Residence Cabins, on the Mendocino national Forest are Beaver Glade Compound, Keller Cabin, and Snow Basin Recreational Residence Cabin. Probability of damage is likely, and magnitude of consequences is moderate, so risk is high.

### 2. Property:

Many roads and trails in the August Complex Fire North Zone Assessment Area lack the proper drainage structures to effectively mitigate the increased runoff and sediment concerns. Potential washouts and road failure could occur on road segments due to the lack of drainage structures downslope of moderate to high SBS, with large segments of fill elevating the road above the native surface. These areas may not handle an increased runoff and sediment delivery, worsening road and trail conditions. Probability of damage is likely, and magnitude of consequences is moderate, so risk is high.

#### NFS Roads

There are 1,064 miles of Forest Service system roads within the August Complex Fire North Zone Assessment Area. Of these, 378.9 miles of Forest Service system roads were found within or downslope of areas with high or modern burn severity. These miles are considered potentially at risk to damage from post-fire increases in flooding, debris flows, and erosion. Engineering assessment team prioritize the road miles as follows:

#### Mendocino National Forest

There are 169 miles of Forest Service system roads with within the Mendocino National Forest of the August Complex Fire North Zone Assessment Area.

Of these, 64.1 miles of Forest Service system roads were found within or downslope of areas with high or modern burn severity.

- 27.5 miles were identified as Operational Maintenance Level 1 in the roads database. While these roads may have a possible/likely probability of damage, the magnitude is considered minor as they have low use and provide access to low value areas, resulting in a low risk.
- 25.1 miles were found to be located on or near ridgetops, dead-end routes, or through routes that were redundant or parallel to another route. These roads may have unlikely/possible probability of damage and have minor/moderate magnitude of consequence, resulting in low risk.
- 11.5 miles were found to be associated with high and moderate SBS with significant upslope source area that will result in increased flooding and debris flow potential, resulting in a likely probability of damage. These roads are necessary for forest management. They provide access to recreation or administrative facilities or are located within watersheds containing federally threatened aquatic habitat. Damage to these routes would have a moderate/major magnitude of consequence, resulting in high/very high risk.
  - i. BAER funds are requested to treat these risks on 11.5 miles of road determined to be High/Very High Risk (*Treatment RD-1*).

#### Shasta-Trinity National Forest

There are 439 miles of Forest Service system roads with within the Shasta-Trinity National Forest of the August Complex Fire North Zone Assessment Area. Of these, 140.2 miles of Forest Service system roads were found within or downslope of areas with high or modern burn severity.

- 49.0 miles were identified as Operational Maintenance Level 1 in the roads database. While these roads may have a possible/likely probability of damage, the magnitude is considered minor as they have low use and provide access to low value areas, resulting in a low risk.
- 60.8 miles were found to be located on or near ridgetops, dead-end routes, or through routes that were redundant or parallel to another route. These roads may have unlikely/possible probability of damage and have minor/moderate magnitude of consequence, resulting in low risk.
- 30.4 miles were found to be associated with high and moderate SBS with significant upslope source area that will result in increased flooding and debris flow potential, resulting in a likely probability of damage. These roads are necessary for forest management. They provide access to recreation or administrative facilities or are located within watersheds containing federally threatened aquatic habitat. Damage to these routes would have a moderate/major magnitude of consequence, resulting in high/very high risk.
  - i. BAER funds are requested to treat these risks on 30.4 miles of road determined to be High/Very High Risk.

#### Six Rivers National Forest

There are 455.5 miles of Forest Service system roads with within the Mendocino National Forest of the August Complex Fire North Zone Assessment Area. Of these, 258.3 miles of Forest Service system roads were found within or downslope of areas with high or modern burn severity.

- 7.1 miles were identified as Operational Maintenance Level 1 in the roads database. While these roads may have a possible/likely probability of damage, the magnitude is considered minor as they have low use and provide access to low value areas, resulting in a low risk.

- 199.4 miles were found to be located on or near ridgetops, dead-end routes, or through routes that were redundant or parallel to another route. These roads may have unlikely/possible probability of damage and have minor/moderate magnitude of consequence, resulting in low risk.
- 51.8 miles were found to be associated with high and moderate SBS with significant upslope source area that will result in increased flooding and debris flow potential, resulting in a likely probability of damage. These roads are necessary for forest management. They provide access to recreation or administrative facilities or are located within watersheds containing federally threatened aquatic habitat. Damage to these routes would have a moderate/major magnitude of consequence, resulting in high/very high risk.
  - i. BAER funds are requested to treat these risks on 51.8 miles of road determined to be high/very high risk.

#### Other

BAER recommends that roads on adjacent lands managed by State of California, BLM, counties, or privately owned also be evaluated for risk from flooding and debris flows, and hazard trees. Of interest is Highway 36 near Forest Glen, Ruth Lake, and the town of Ruth. These areas may experience increased flow, possible flooding during high intensity rainstorms, rockfall, debris flows or landslides.

#### NFS Trails

Trails are at risk due moderate and high soil burn severity making hillslopes above trails more susceptible to erosion, trails crossing streams more susceptible to washouts, tree burnouts compromising trail treads. Probability of damage is likely, and magnitude of consequences is moderate, so risk is high.

Trail surveys conducted by the BAER team showed most trail damage occurs in the moderate to high soil burn severity areas. Intersecting soil burn severity with forest trails shows for the Mendocino NF there are 44.2 miles of severely burned trails, 29.6 miles for the Shasta-Trinity, and 28 miles for the Six Rivers (Table 1 below).

**Table 1:** Trails that are in moderate and high soil burn severity areas for each forest:

<b>Forest Trails</b>	<b>Moderate</b>	<b>High</b>	<b>Grand Total</b>
Mendocino NF	40.3	3.9	44.2
Shasta-Trinity NF	27.5	2.1	29.6
Six Rivers NF	22.7	5.3	28.0
<b>Grand Total</b>	<b>90.5</b>	<b>11.4</b>	<b>101.8</b>

Of the trails in moderate to high soil burn severity about 30% were on slopes less than 20% and will need minimal treatments of stump burnout repairs.

#### NFS Campgrounds

Recreational facilities as well as numerous trailheads have also been impacted by the fire to varying degrees. Hazards associated with the fire-killed and damaged trees will need to be abated (including removal where substantial debris exists) prior to opening facilities to the public. These campgrounds are scheduled to be closed by the forest and costs associated with the closures are not included in this assessment.

Recreational facilities affected include 4 sites on the Six Rivers (Ruth Guard Station, Watts Lake Campground Fir Cove Campground, Lake Vista Interpretive Trail), 8 sites on the Shasta-Trinity (Forest Glen Campground, Hellgate Campground, Scott Flat Campground, Tomhead Saddle Campground, Forest Glen Guard Station/Recreation Rental, Stuart Gap Trailhead, Rat Trap Gap Trailhead, and North Yolla Bolly Lake) and 9 sites on the Mendocino (Green Springs Campground,

Hammerhorn Lake, Little Doe Campground, Howard Lake Campground, Howard Meadows Campground, Rock Cabin Trailhead, Ides Cove Horse Packer Trailhead, and Ides Backpacker Trailhead).

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

#### Invasive Weeds - Fire Suppression Activities

Fire suppression activities and areas of moderate to high burn severity have removed over-story cover, which opens the ground to full sunlight. Some of these locations have also lost most of the native seed bank to burning or removal of soil. The probability of damage or loss is very likely, because areas of exposed soil due to fire suppression activities are susceptible to weed invasion and spread. There is a risk of invasive weed establishment in areas disturbed by machinery because equipment used in fire suppression was not cleaned prior to entering the fire line. Equipment may have introduced invasive plant propagules from previous work sites, or from drop points and access routes into the fire, many of which are infested with invasive plant species. The magnitude of consequences is moderate. Introduction and expansion of weeds can suppress native vegetation recovery and lead to a loss of native and naturalized plant communities. The resulting risk is very high.

- BAER funds are requested to treat these risks (Treatments LD-1).

#### Fisheries Affected

##### **Eel River Basin**

Northern California Steelhead, DPS (Threatened) -  
California Coastal Fall Run Chinook Salmon ESU (Threatened)

##### **Mad River**

Northern California Steelhead, DPS (Threatened)

##### **Van Duzen River**

Northern California Steelhead, DPS (Threatened)

##### **Sacramento River Basin**

Central Valley Spring Run Chinook Salmon ESU (Threatened)  
Sacramento River Winter Run Chinook Salmon ESU (Threatened)  
California Central Valley Steelhead DPS (Threatened)

##### **South Fork Trinity River**

Upper Klamath/Trinity Chinook (Not Currently Listed - Petitioned)  
Klamath Mountain Province Steelhead (Not Federally Listed)  
Coho Salmon Southern Oregon Northern California, ESU (Threatened)

##### **Threat**

There is a threat of short- and long-term degradation of suitable and occupied spawning and rearing habitat for fish species throughout the analysis area due to scouring, sediment and debris flows, negatively affecting water quality. Decreases in streamside vegetation and impacts to stream bank conditions increase water temperature due to loss of shading in watersheds. Due to the above changes, negative impacts to aquatic invertebrates and phytoplankton is possible in many watersheds. Unburned, or lightly burned riparian buffers are expected to help filter some of the pollutants. Natural recovery will occur in most of these systems, so the risk varies depending on the burn severity of the basin.

Value-at-Risk (VAR)	Watershed (Streams)	Probability	Magnitude of Consequences	BAER Risk Assessment
Coho Salmon	Eel River downstream of Scott Dam	Unlikely	Minor	Very Low

and Critical Habitat				
	South Fork Trinity River	Possible	Minor	Low
Chinook Salmon and Critical Habitat	Middle Fork and North Fork of the Eel and Tributaries	Possible	Moderate	Low
	Mad River	Possible	Moderate	Intermediate
	Van Duzen River	Unlikely	Minor	Very Low
	South Fork Trinity River (no critical habitat)	Possible	Moderate	Intermediate
	Cottonwood Creek, Sacramento Drainage	Possible	Moderate	Intermediate
Steelhead and Critical Habitat	Middle Fork and North Fork of the Eel and Tributaries	Possible	Minor	Low
	Mad River	Possible	Moderate	Intermediate
	Van Duzen River	Unlikely	Minor	Very Low
	South Fork Trinity River (no critical habitat)	Possible	Moderate	Intermediate
	Cottonwood Creek, Sacramento Drainage	Possible	Moderate	Intermediate

#### 4. Cultural and Heritage Resources (CHR):

- *Increased visibility leading to looting*

There is a threat of the loss of historic context and contents due to the increased exposure of archaeological sites as a result of the fire. The probability of damage or loss is possible or likely because archaeological and historic sites near recreational areas or roads are more visible to the public and vulnerable to looting. The magnitude of consequences is moderate or major, as artifacts within cultural sites retain key information to understanding the past. Cultural resources are non-renewable. Removed artifacts from historic contexts degrade the meaning of historic sites and features and their potential to provide important information about the past to this and future generations. The resulting risk is intermediate to high.

- BAER funds are requested to treat these high risks (Treatments in CR-1).

#### B. Emergency Treatment Objectives:

To allow safe passage of water to protect infrastructures and watersheds from accelerated sheet and rill erosion. To protect watersheds from the spread of noxious weeds and hazardous materials. Risk determination is dependent on the design storm selected and downstream values at risk. By using an average storm (2-year event) emergency planning measures can be designed to mitigate and minimize anticipated risks. Generally, using a 2-year design storm the values at risk can be evaluated to determine if an emergency exists but in areas prone to intense thunderstorms a 5 to 10-year storm may be more appropriate.

- Mitigate and protect, to the extent possible, threats to personal injury or human life of forest visitors and Forest Service employees by raising awareness through posting hazard warning signs on roads and trails, and communicate hazard of flooding, and debris flows. Communicate to cooperating agencies and community groups.
- Protect or minimize damage to NFS investments in roads and trail infrastructure by installing drainage features capable of withstanding potential increased stream flows and/or debris flows. Minimize damage to key NFS travel routes.
- Protect or mitigate potential post-fire impacts to critical cultural resources within the burned area.

- Treat invasive plants that are a threat to native and naturalized ecosystems by minimizing the expansion of existing populations in the burned area and control of expected invasion of noxious weeds within and adjacent to the area where soils/vegetation was disturbed as a result of fire suppression activities.
- Assist cooperators, other local, State, and Federal agencies with the interpretation of the assessment findings to identify potential post-fire impacts to communities and residences, domestic water supplies, public utilities and other infrastructure.

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

\*Land 70 % Channel - % Roads/Trails 70 % Protection/Safety 85 %

\*EDRR treatments would be conducted in the spring/summer 2021.

### D. Probability of Treatment Success

*Table 4: 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>	95%	85%	80%
<b>Channel</b>	-	-	-
<b>Roads/Trails</b>	95%	90%	85%
<b>Protection/Safety</b>	95%	90%	80%

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

**Human Health and Safety:** Human Life and Safety do not have a market value, but an injury would exceed \$1,000,000, providing a substantial benefit/cost ratio.

**Property:** The cost to rebuild sections of the road after they are washed out, eroded, or buried includes estimates to bring in material to build up the damaged roads. The cost of not fixing the proposed 93.7 miles of road is approximately \$16,867,000 providing at least a 14:1 benefit/cost ratio. This does not include the lost value to project management, fire suppression, and recreation.

**Land Treatments - Native and Naturalized Plant Communities:** There is an approximate benefit of greater than 10:1 of treating invasive species prior to establishment.

**Cultural and Heritage Resources:** Economic values can not be placed on the loss of cultural and heritage resources. The cultural or historic resource at risk is eligible, or potentially eligible, for listing on the National Register of Historic Places (NRHP). Delaying emergency treatment could permanently remove the cultural significance of these sites.

### F. Cost of Selected Alternative (Including Loss):

## Human Health and Safety:

Hazmat Stabilization and Warning Signs

Treatment	Quantity	Unit	Cost	Total
Large Burned Area Hazard Signs	20	each	\$400.00	\$8,000
Small Burned Area Hazard signs	30	each	\$200.00	\$6,000
Hazmat Stabilization Treatments	1	projects	\$46,200	\$46,200
<b>Total Costs</b>				<b>\$60,200</b>

## Property:

RD1: The cost to treat 93.7 miles of road within the assessment areas is \$1,214,847. Detail costs are included in the assessment project record Engineering Report.

Road Treatment Costs	Unit	Quantity	Cost/Unit	Total Cost
Storm proofing	mile	93.7	\$ 9,598.54	\$ 899,383
Storm Inspection and Response	mile	93.7	\$ 1,463.13	\$ 137,095
Archaeologist Implementation Monitoring	days	\$300.00	\$60.00	\$18,000
Administrative	lump sum	1	\$ 157,895.00	\$ 160,369
<b>Total Cost</b>				<b>\$1,214,847</b>
<b>By Forest:</b>				
MNF				<b>\$81,098</b>
SHF				<b>\$547,894</b>
SRF				<b>\$585,855</b>

TR1: The cost to treat 101.8 miles of trails within the moderate to high soil burn severity assessment areas is \$428,000. Detail costs are included in the assessment project record Recreation Report.

Forest Trails	Miles	Miles per spike	Cost per spike	Total Cost
Mendocino NF	44.2	6	\$25,000	\$185,000
Shasta-Trinity NF	29.6	6	\$25,000	\$125,000
Six Rivers NF	28.0	6	\$25,000	\$118,000
<b>Grand Total</b>	<b>101.8</b>			<b>\$428,000</b>

## LD-1: EDRR Treatment Costs: Suppression Related

The total cost estimate for EDRR treatment on 168 miles of dozer line and road-as-line and 131 acres of drop points, helispots, and staging areas is an estimated \$307,400. See below for cost estimates.

Feature	Unit Cost	SHF	SRF	MNF	Totals
Dozer Line	Miles at \$1050/mile	33	73	20	126
Hand Line	Not treated	-	-	-	-
Road-as-Line	Miles at \$1050/mile	22	13	7	42
Drop points, Helispots, and Staging Area	Acres at \$1000/acre	52	72	7	131

Total		\$109,750	\$162,300	\$35,350	\$307,400
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## Cultural and Heritage Resources

### CR-1:

Heritage BAER Land Treatment consists of seeding a visible cultural site with native grasses which will also prevent the influx of invasive weeds, rebuilding a fence around a historic grave near a popular recreational area.

Treatment	Units	Unit Cost	# of Units	Total Cost
Seeding of site 05-14-52-133 (SHF)	Bag	\$50.00	1	\$50
Implementation Monitoring by GS 9/11 Archaeologist for seeding and grave site (SHF)	Days	\$300.00	1.5	\$450
Fence supplies and hardware (SHF)		\$100.00	1	\$100
Fence labor (2 recreation techs) (SHF)	Days	\$300.00	1	\$600
Implementation Monitoring by GS9/11 Archaeologist for SRF sites	Days	\$300.00	4.25	\$2,000
Site assessments on SRF by GS 9/11 Archaeologist	Days	\$300.00	5	\$1,500
<b>Total Cost of Heritage Land Treatment - SHF</b>				<b>\$1,200</b>
<b>Total Cost of Heritage Land Treatment - SRF</b>				<b>\$3,500</b>

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

**Table 4: BAER Team Members by Skill (North Assessment)**

Brad Rust	TL-1	CA	Shasta Trinity	<a href="mailto:brad.rust@usda.gov">brad.rust@usda.gov</a>	530-806-5406
Luke Rutten	Lead Hydro	CA	Tahoe	<a href="mailto:luke.rutten@usda.gov">luke.rutten@usda.gov</a>	218-766-8662
Jeff TenPas	Interagency Coord.	CA	Shasta Trinity	<a href="mailto:jtenpas@lycos.com">jtenpas@lycos.com</a>	920-917-8409
Cathy Carlock	Logistics - 1	CA	Modoc	<a href="mailto:cathy.carlock@usda.gov">cathy.carlock@usda.gov</a>	530-569-0060
Melissa Church	Logistics - 2	CA	Shasta Trinity	<a href="mailto:melissa.church@usda.gov">melissa.church@usda.gov</a>	530-515-8175
Eric Nicita	Soils	CA	Eldorado	<a href="mailto:eric.nicita@usda.gov">eric.nicita@usda.gov</a>	530-748-5827
Dennis Veich	Geology	CA	Shasta Trinity	<a href="mailto:dennis.veich@usda.gov">dennis.veich@usda.gov</a>	530-515-7414
Adam Dresser	Hydro-1	CA	Six Rivers	<a href="mailto:adam.dresser@usda.gov">adam.dresser@usda.gov</a>	707 502-7321
Rachel Hutchinson	Hydro -2	CA	Tahoe	<a href="mailto:rache..hutchinson@usda.gov">rache..hutchinson@usda.gov</a>	530-613-0439
Edgar Martinez	Hydro-3 (t)	R3	Gila	<a href="mailto:edgar.Martinez@usda.gov">edgar.Martinez@usda.gov</a>	715-451-6576
Jonna DuShey	GIS-1	CA	Shasta Trinity	<a href="mailto:jonna.dushey@usda.gov">jonna.dushey@usda.gov</a>	928-266-5544
Matt House	GIS-2	CA	Mendocino	<a href="mailto:matt.house@usda.gov">matt.house@usda.gov</a>	530-368-1035
Alvin Sarmiento	Eng	CA	Shasta Trinity	<a href="mailto:alvin.sarmiento@usda.gov">alvin.sarmiento@usda.gov</a>	530-708-1363
Joseph Lumpkin	Eng (t)	CA	Shasta Trinity	<a href="mailto:Joseph.Lumpkin@usda.gov">Joseph.Lumpkin@usda.gov</a>	530-410-3609
Nathan G. Robinson	Eng (t)	CA	Inyo	<a href="mailto:nathan.g.robinson@usda.gov">nathan.g.robinson@usda.gov</a>	385-867-4372
Dan Teater	Fisheries	CA	Tahoe	<a href="mailto:dan.teater@usda.gov">dan.teater@usda.gov</a>	530-613-7040
Yvette Paroz	Fisheries	R3	Albuquerque	<a href="mailto:yvette.paroz@usda.gov">yvette.paroz@usda.gov</a>	505-250-5678
Doreen Hrvnak	Arch	CA	Six Rivers	<a href="mailto:doreen.hrinak@ussa.gov">doreen.hrinak@ussa.gov</a>	530-966-4048
Kimberly Stahl	Arch	CA	Shasta Trinity	<a href="mailto:kimberly.stahl@usda.gov">kimberly.stahl@usda.gov</a>	248-224-4940
Lusetta Sims	Bot-1 SHF	CA	Shasta Trinity	<a href="mailto:lusetta.sims@usda.gov">lusetta.sims@usda.gov</a>	530-551-1913
Lisa Hoover	Bot-1 SRF	CA	Shasta Trinity	<a href="mailto:lisa.hoover@usda.gov">lisa.hoover@usda.gov</a>	707-441-3612
John McRae	Bot-2 SRF	CA	Six Rivers	<a href="mailto:john.mcrae3@usda.gov">john.mcrae3@usda.gov</a>	707-441-3513
Thomas Carlberg	Bot-3 SRF	CA	Six Rivers	<a href="mailto:thomas.carlberg@usda.gov">thomas.carlberg@usda.gov</a>	707-441-3541

**H. Treatment Narrative:**

The proposed treatments on National Forest System lands can help to reduce the impacts of the fire, but treatments will not completely mitigate the effects of the fire. The treatments listed below are those that are the most effective on National Forest System lands given the local setting including topography and access.

**Human Health and Safety:****Hazmat Stabilization:**

Beaver Glade compound has burned buildings, barracks, shops, equipment storage sites that pose a hazmat threat due to burned and released chemicals mixing with gas and oil along with building materials creating a toxic cocktail that is readily mobile. Treat all structures with hazardous materials (BG compound and recreational resident houses and outbuildings) with hydro-mulch to tackily all mobile ash. Place charcoal absorbent socks around main building and outbuilding footprints to absorb chemical slurry. Mulch (wood-straw) outside of structure perimeter and place silt fencing to trap any migrating sediments to reduce the likelihood of erosion causing offsite migration of contaminated ash and soil into downstream water bodies.

**Protection/Safety Treatments:**

Posting signs in areas burned to alert the public to potential dangers of falling trees, increased runoff, hazardous rockfall.

**Entering Burn Area Warning Signs (August North)**

Warning signs to warn the public that they are entering a burned area and campgrounds and to watch for flooding, rockfall, landslides and hazard trees will be placed at all the main entrances into the burn area and at select campgrounds where hazards exist. Selected campgrounds will be temporary closed until hazards are mitigated.

**Property:****Roads and Trail Treatments:****Roads:****Safety**

Warning signs would need to be installed to warn road users of the unmitigated dangers present in the FS fire area.

Additionally, to limit OHV access in the burned areas, it is recommended to install OHV breaks in several areas throughout the fire perimeter.

**Storm proofing**

In and downslope of the moderate and high burn severity areas that occur along slopes greater than 20%, a lack of additional drainage structures could compromise the road infrastructure access. Concern exists for possible washouts to damage sections during large seasonal thunderstorm events. To mitigate against any increased runoff and sediment delivery, it is recommended to install rolling dips, waterbars, and clean and armor existing culverts. Additionally, it recommended to improve spots of existing in-slope ditches to provide relief in the occurrence of storm events. This feature will be opened up in various locations along its length to allow drainage of the road surface and minimize erosion. At certain crossings vegetation clearing and additional armoring is needed around the culverts to allow water and debris to pass through. A qualified Archaeologist will monitor the road repair, culvert work, and other ground disturbing work on sensitive sites.

**Storm Inspection and Response**

In addition to the roads receiving treatments, additional roads that are along a moderate burn severity would need to be monitored during and after storm events. Storm inspection and response would allow the forest to monitor the road drainage structure treatments to ensure the treatments are functioning, clean the area to ensure they continue to function in the future, and maintain and/or repair any damage to the road surface due to the sediment delivery.

93.7 miles of roads within the north assessment area have been identified and prioritized for treatment. The remaining 259 miles of road within the high and moderate burn area will be treated through natural recovery of the watershed condition.

Existing cultural sites within treatment areas will need implementation monitoring to avoid adverse effects to the site. Cultural resources are non-renewable. Removed artifacts from historic contexts degrade the meaning of historic sites and features and their potential to provide important information about the past to this and future generations.

#### Trails:

There are 30.9 miles for the Mendocino NF of severely burned steep trails (slopes greater than 20%), 20.8 miles for the Shasta-Trinity NF, and 19.6 miles for the Six Rivers NF. Trails on slopes less than 20% only suffered minor damage of stump burnouts and will not be subject to excessive erosion of stream crossing blow-outs. Management treatments will focus on hazard tree removal along trails that pose risk to crews working on treatment sections. Trails will be water-barring and trail tread repair in severely burned areas consisting of stabilizing trail tread from collapse due to burned stump-holes. Trail stream crossings will be rock reinforced to protect from increased flows washing out the trail. A combination of actions is necessary to protect the trails; emergency work by competent trail crews (CCC spike + overhead), signing trail with warning of hazardous conditions due to the burn.

#### Natural Resources Treatments:

Early Detection Rapid Response (EDRR): An emergency exists with respect to natural vegetation recovery due to the threat of invasive weed introduction and spread.

Native and Naturalized Plant Communities: EDRR surveys on 246 miles of dozer line and roads-as-line and 131 acres of drop spots, helispots, and staging areas of the Shasta-Trinity, Six Rivers, and Mendocino NF lands based on values at risk, current infestation sizes, areas that were disturbed by suppression activities, and/or fire risk resulting from moderate or high SBS that resulted in unacceptable risks to natural resources. EDRR surveys will be conducted by forest personnel or contracted. The weed risk to native plant community recovery can be mitigated at low cost by implementing EDRR within the first year after the fire. New, small weed infestations located during EDRR surveys will be manually treated upon discovery. Existing infestations found to be expanding due to the fire or fire suppression activities would be re-mapped and evaluated for treatment.

#### Cultural and Heritage Treatments:

Cultural Resource Protection: Implement measures to hinder ground visibility at one archaeological site by seeding with native grasses. Build a protective fence around a historic grave so future emergency ground disturbing work will not affect the feature nor lose the location of the burial. Clean-out a blocked culvert within an archaeologist site. A qualified Archaeologist will monitor the road repair, culvert work, and other ground disturbing work on sensitive sites.

#### I. Monitoring Narrative:

Road and trail monitoring to ensure treatments are working and if not what is needed to insure treatment success.

**PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS****Mendocino NF - August Complex – NORTH Part – Interim 2**

Mendocino		NFS Lands			Other	Other Lands			All	
		Unit	# of			# of	Fed	# of		
		Line Items	Units	Cost		Units	\$	units	\$	\$
<b>A. Land Treatments</b>										
LD-1: EDRR Suppression - lines	project	35,350	1	\$35,350	\$0		\$0		\$0	\$35,350
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Land Treatments</b>				<b>\$35,350</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$35,350</b>
<b>B. Channel Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Channel Treatments</b>				<b>\$0</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$0</b>
<b>C. Road and Trails</b>										
RD1. Storm Proofing and Storm Patrol	project	81,098	1	\$81,098	\$0		\$0		\$0	\$81,098
TR1. Trail Storm Proofing	project	125,000	1	\$125,000						\$125,000
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
				<b>\$206,098</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$206,098</b>
<b>D. Protection/Safety</b>										
PS-1 Warning Signs	project	5,000	1	\$5,000	\$0		\$0		\$0	\$5,000
PS-2 Hazmat Stabilization	project	24,200	1	\$24,200	\$0		\$0		\$0	\$24,200
PS-3 Hazard Tree Removal	mile	4,300	2	\$8,600	\$0		\$0		\$0	\$8,600
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Protection/Safety</b>				<b>\$37,800</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$37,800</b>
<b>E. BAER Evaluation</b>										
Initial Assessment	Report			--	\$211,071					
<i>Insert new items above this line!</i>				--	\$0					
<b>Subtotal Evaluation</b>				<b>\$0</b>	<b>\$211,071</b>					
<b>F. Monitoring</b>										
Road & Trail Treatment Monitoring	project	\$2,000	1	\$2,000	\$0		\$0		\$0	\$2,000
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Monitoring</b>				<b>\$2,000</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$2,000</b>
<b>G. Total INTERIM 2</b>										
Previously approved				\$281,248	\$211,071		\$0		\$0	\$281,248
				\$300,000						

Mendocino initial request received \$300,000 already so this interim is in addition to initial funding.

**Shasta-Trinity NF** - August Complex – NORTH Part – Interim 2

Shasta-Trinity		NFS Lands			Other	Other Lands			All	
		Unit	# of	BAER \$		# of	Fed	# of		
						units	\$	Units	\$	
<b>A. Land Treatments</b>										
LD-1: EDRR Suppression - lines	project	109,750	1	\$109,750	\$0		\$0		\$0	
CR-1- Cultural sites stabilization	project	1,500	1	\$1,500	\$0		\$0		\$0	
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	
<b>Subtotal Land Treatments</b>				<b>\$111,250</b>	<b>\$0</b>		<b>\$0</b>		<b>\$111,250</b>	
<b>B. Channel Treatments</b>										
				\$0	\$0		\$0		\$0	
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	
<b>Subtotal Channel Treatments</b>				<b>\$0</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	
<b>C. Road and Trails</b>										
RD1. Storm Proofing and Stormpartol	project	547,894	1	\$547,894	\$0		\$0		\$0	
TR1. Trail Stormproofing	project	100,000	1	\$100,000					\$100,000	
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	
<b>Subtotal Road and Trails</b>				<b>\$647,894</b>	<b>\$0</b>		<b>\$0</b>		<b>\$647,894</b>	
<b>D. Protection/Safety</b>										
PS-1 Warning Signs	project	4,000	1	\$4,000	\$0		\$0		\$0	
PS-2 Hazmat Stabilization	project	22,000	1	\$22,000	\$0		\$0		\$0	
PS-3 Hazard Tree Removal	mile	4,300	3	\$12,900	\$0		\$0		\$0	
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	
<b>Subtotal Protection/Safety</b>				<b>\$38,900</b>	<b>\$0</b>		<b>\$0</b>		<b>\$38,900</b>	
<b>E. BAER Evaluation</b>										
Initial Assessment	Report			---	\$0		\$0		\$0	
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	
<b>Subtotal Evaluation</b>				<b>\$0</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	
<b>F. Monitoring</b>										
Road & Trail Treatment Monitoring	project	\$2,000	1	\$2,000	\$0		\$0		\$0	
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	
<b>Subtotal Monitoring</b>				<b>\$2,000</b>	<b>\$0</b>		<b>\$0</b>		<b>\$2,000</b>	
<b>G. Total INTERIM 2</b>										
Previously approved				\$800,044	\$0		\$0		\$800,044	
Grand Total of Request (to date) - SHF - August North Complex				<b>\$100,000</b>						
				<b>\$700,044</b>						

**Six Rivers NF - August Complex – NORTH Part – Interim 2**

Six Rivers		NFS Lands			Other	Other Lands				All		
		Unit	# of	BAER \$		# of	Fed	# of	Non Fed			
						Line Items	Units	Cost	\$			
<b>A. Land Treatments</b>												
LD-1: EDRR Suppression - lines	project	162,300	1	\$162,300	\$0			\$0	\$0	\$162,300		
CR-1 - Cultural sites stabilization	project	3,500	1	\$3,500	\$0			\$0	\$0	\$3,500		
<i>Insert new items above this line!</i>				\$0	\$0			\$0	\$0	\$0		
<i>Subtotal Land Treatments</i>				<b>\$165,800</b>	<b>\$0</b>			<b>\$0</b>	<b>\$0</b>	<b>\$165,800</b>		
<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>				<b>\$0</b>	<b>\$0</b>			<b>\$0</b>	<b>\$0</b>	<b>\$0</b>		
<b>C. Road and Trails</b>												
RD1. Stormproofing & Stormpatrol	project	585,855	1	\$585,855	\$0			\$0	\$0	\$585,855		
TR1. Trail Stormproofing	project	75,000	1	\$75,000	\$0			\$0	\$0	\$75,000		
<i>Insert new items above this line!</i>				\$0	\$0			\$0	\$0	\$0		
<i>Subtotal Road and Trails</i>				<b>\$660,855</b>	<b>\$0</b>			<b>\$0</b>	<b>\$0</b>	<b>\$660,855</b>		
<b>D. Protection/Safety</b>												
PS-1 Warning Signs	project	5,000	1	\$5,000	\$0			\$0	\$0	\$5,000		
PS-2 Hazard Tree Removal	mile	4,300	2	\$8,600	\$0			\$0	\$0	\$8,600		
<i>Insert new items above this line!</i>				\$0	\$0			\$0	\$0	\$0		
<i>Subtotal Protection/Safety</i>				<b>\$13,600</b>	<b>\$0</b>			<b>\$0</b>	<b>\$0</b>	<b>\$13,600</b>		
<b>E. BAER Evaluation</b>												
Initial Assessment	Report			--	\$0			\$0	\$0	\$0		
<i>Insert new items above this line!</i>				--	\$0			\$0	\$0	\$0		
<i>Subtotal Evaluation</i>				<b>\$0</b>	<b>\$0</b>			<b>\$0</b>	<b>\$0</b>	<b>\$0</b>		
<b>F. Monitoring</b>												
Road & Trail Treatment Monitoring	project	\$2,000	1	\$2,000	\$0			\$0	\$0	\$2,000		
<i>Insert new items above this line!</i>				\$0	\$0			\$0	\$0	\$0		
<i>Subtotal Monitoring</i>				<b>\$2,000</b>	<b>\$0</b>			<b>\$0</b>	<b>\$0</b>	<b>\$2,000</b>		
<b>G. Total INTERIM 2</b>												
Previously approved				\$100,000								
Grand Total of Request (to date) - SRF - August North Complex				<b>\$742,255</b>								

**PART VII - APPROVALS**

1. \_\_\_\_\_  
Mendocino Forest Supervisor Date

2. \_\_\_\_\_  
Six Rivers Forest Supervisor Date

3. \_\_\_\_\_  
Shasta-Trinity Forest Supervisor Date

## Appendix A – Response Maps

Figure 1. August Complex-NORTH Part – Soil Burn Severity

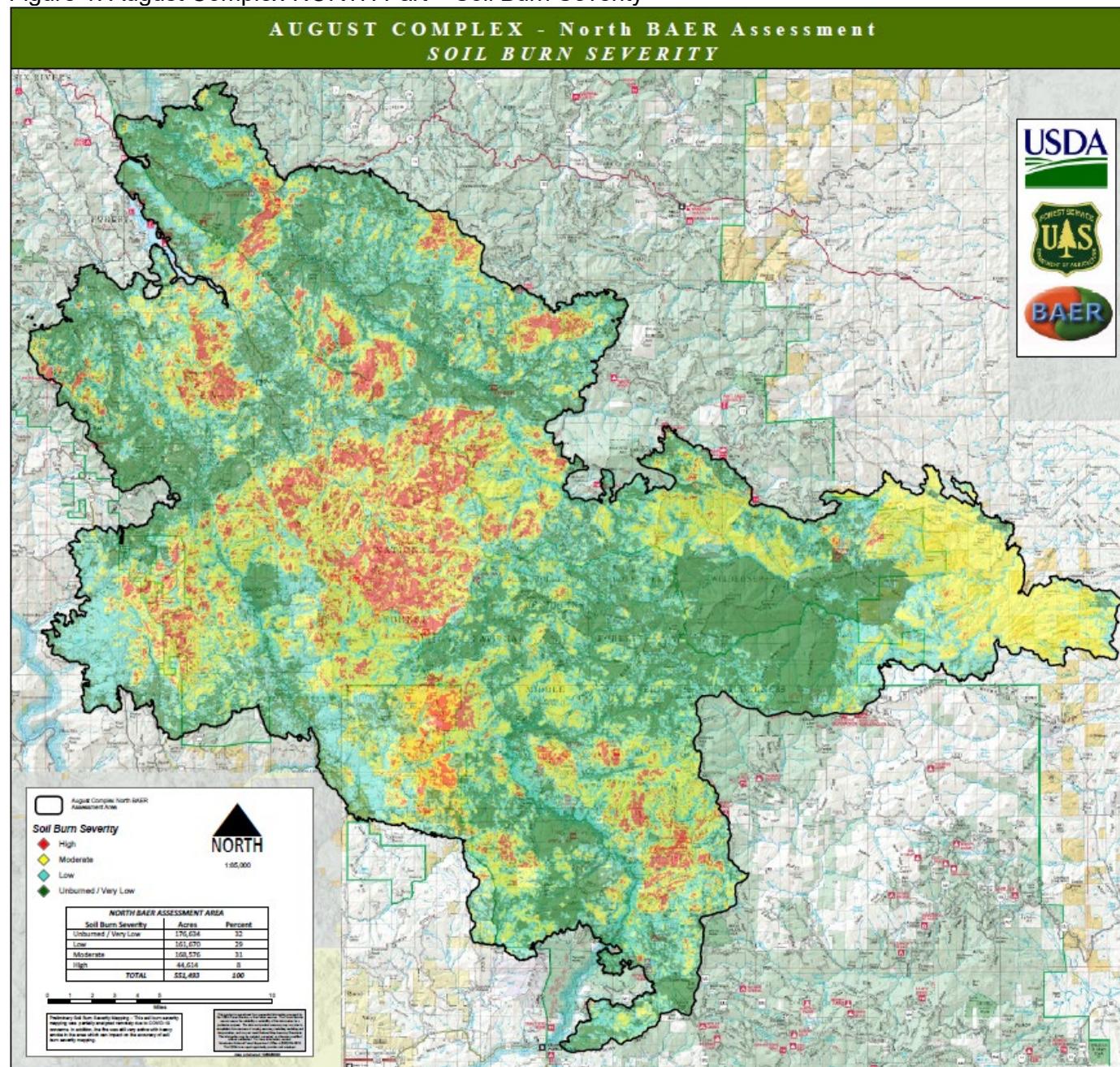


Figure 2. August Complex – Upper Mad River Soil Burn Severity

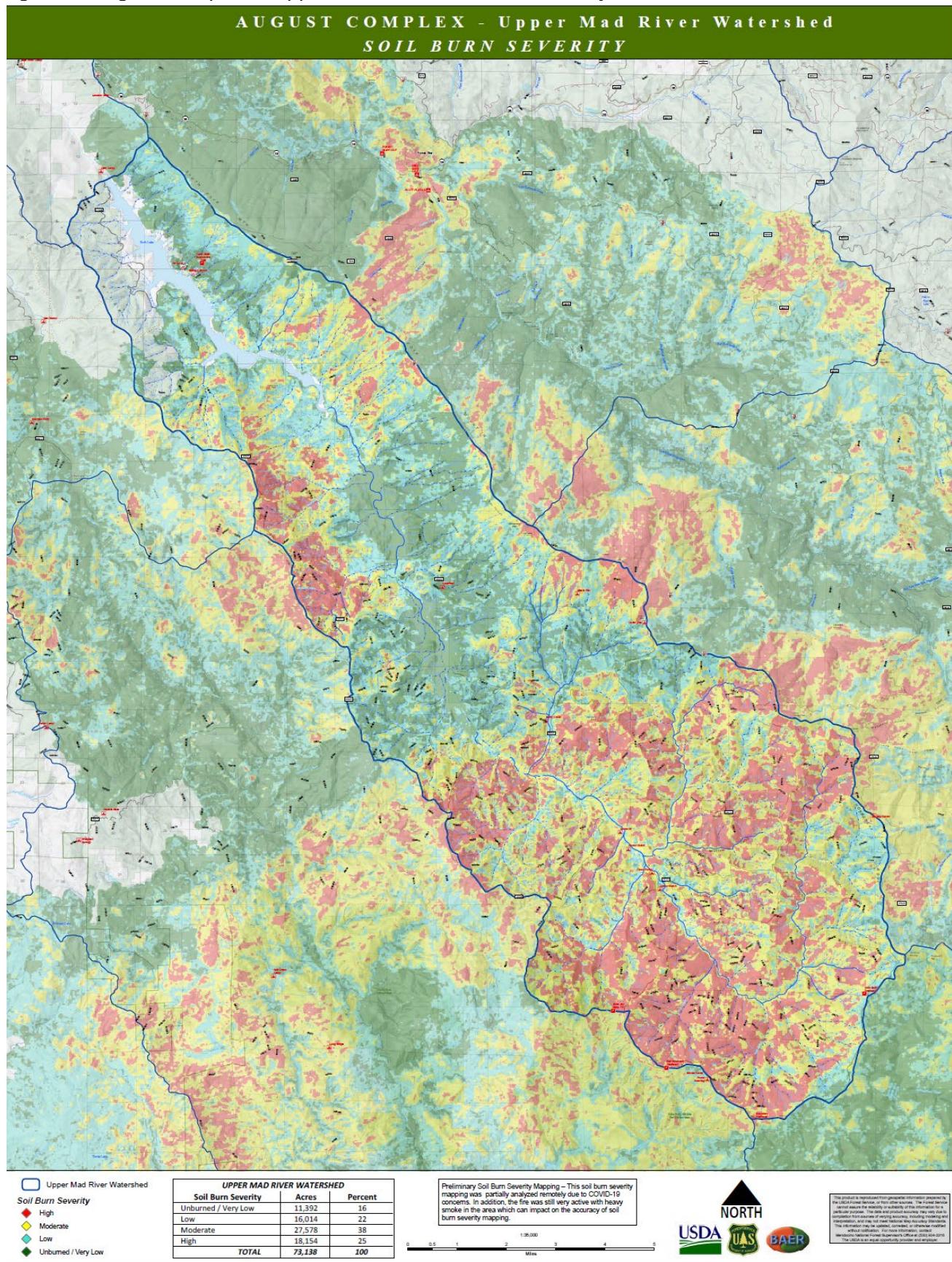


Figure 3. August Complex – South Fork Trinity Soil Erosion Response

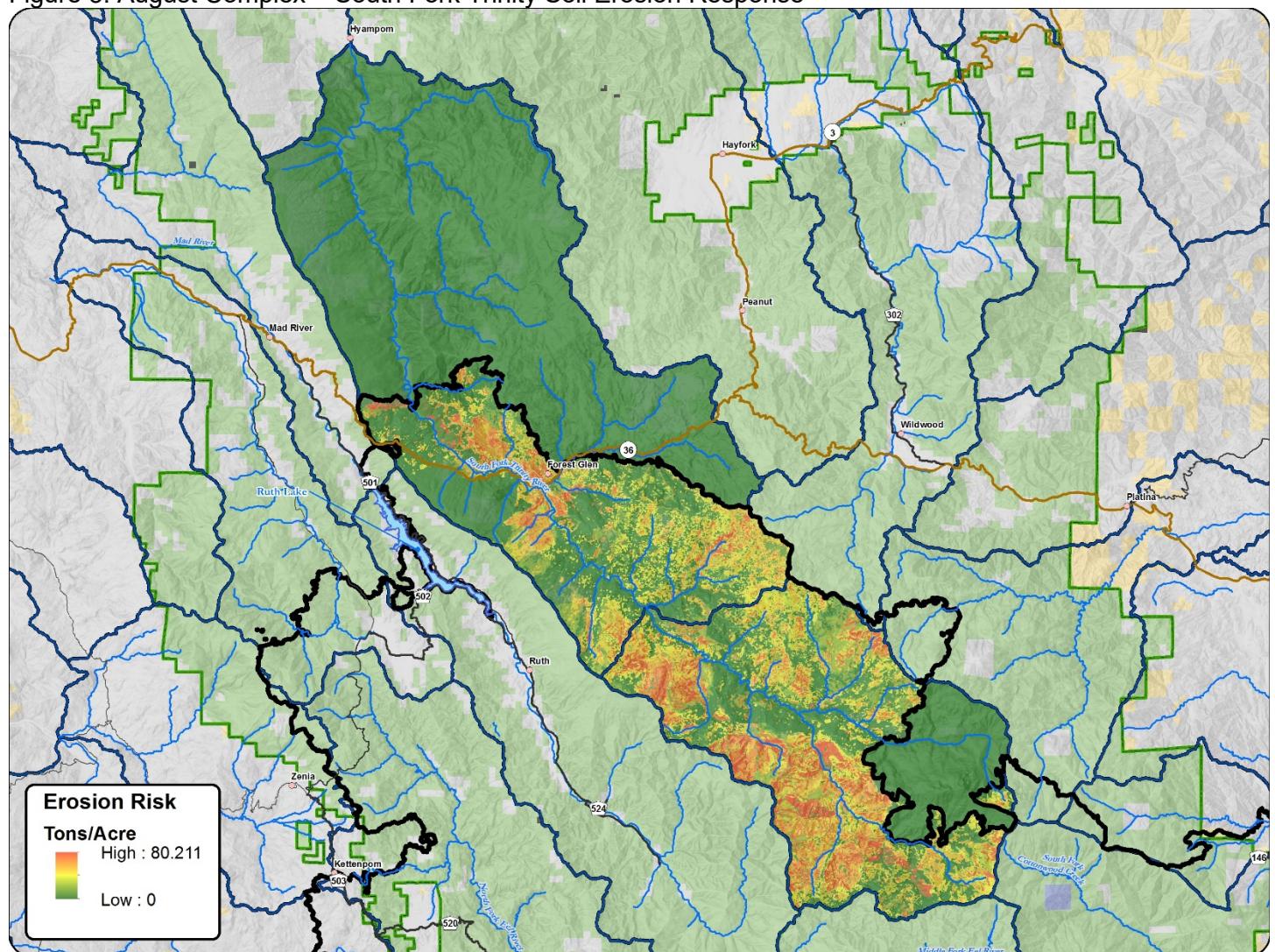


Figure 4. August Complex – Upper Mad River Soil Erosion Response

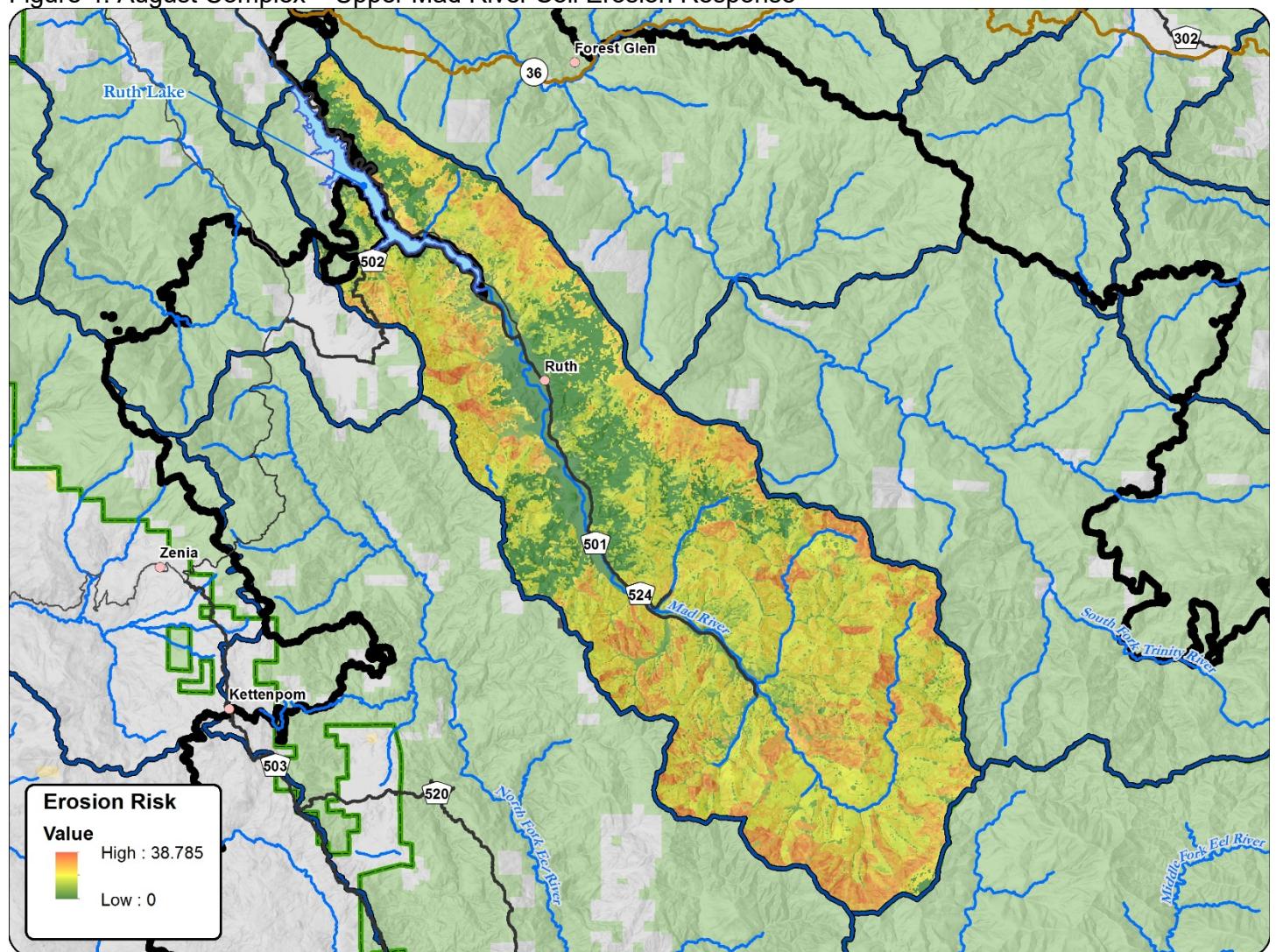


Figure 5. August Complex-NORTH Part – Watershed Runoff Response Pour Points

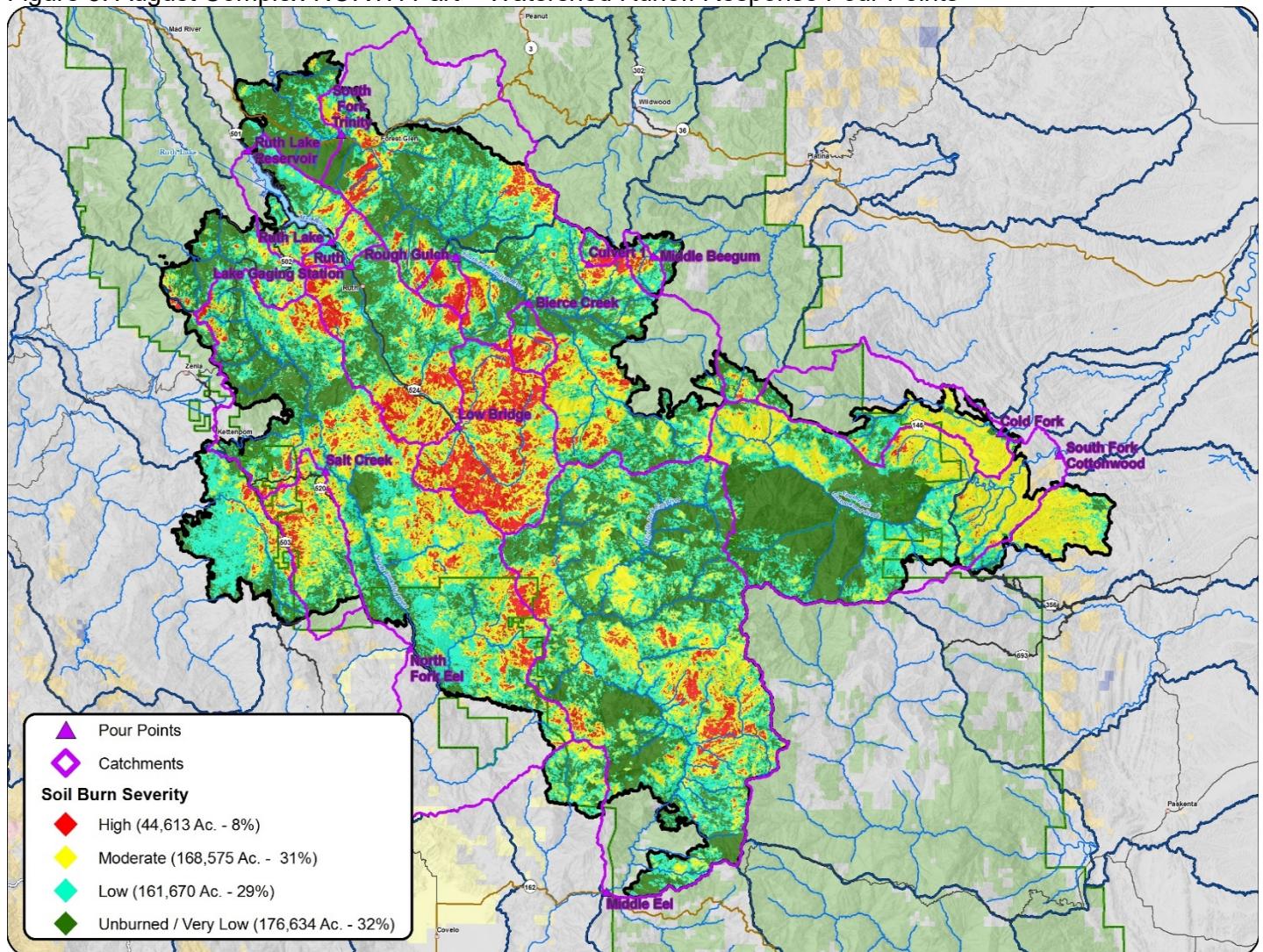


Figure 6. Debris Flow Potentials (probability and volume) per Watershed

