

**Date of Report:****BURNED-AREA REPORT****PART I - TYPE OF REQUEST****A. Type of Report**

- 1. Funding request for estimated emergency stabilization funds
- 2. No Treatment Recommendation

**B. Type of Action**

- 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
- 2. Interim Request #\_\_\_\_\_
  - Updating the initial funding request based on more accurate site data or design analysis

**PART II - BURNED-AREA DESCRIPTION**

**A. Fire Name:** Tenant**B. Fire Number:** 2021-CAKNF-005169**C. State:** California**D. County:** Siskiyou**E. Region:** R5**F. Forest:** Klamath**G. District:** Goosenest**H. Fire Incident Job Code:** P5N329 0505**I. Date Fire Started:** June 28, 2021**J. Date Fire Contained:** July 12, 2021**K. Suppression Cost:** \$15,201,582**L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

Sum of Miles Row Labels	Column Labels		
	Klamath National Forest	Unknown / Private	Grand Total
Completed Dozer Line	26.0	19.1	45.1
Completed Hand Line	4.3	4.7	8.9
<b>Grand Total</b>	<b>30.3</b>	<b>23.8</b>	<b>54.1</b>

1. **Fireline repaired (miles):** 45.1 mi dozer line, 8.9 mi handline  
 → Other (identify):

**M. Watershed Numbers:**

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
180102050105	Lower Butte Creek	33,132	5,849	18
180102050103	Horsethief Creek	27,198	1,962	7
180102050305	Prather Creek	17,298	3,703	21

**N. Total Acres Burned:**

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	8,583
OTHER FEDERAL (LIST AGENCY AND ACRES)	0
STATE	0
PRIVATE	2,929
<b>TOTAL</b>	<b>11,512</b>

**O. Vegetation Types:** Vegetative communities affected by the Tenant fire mainly included juniper-shrub woodlands and lodgepole pine forests.

**P. Dominant Soils:** The soils are derived primarily from three terranes; basalt flows and cinders, scarp slopes from basin and range faulting, and uplifted Miocene lake deposits. The primary soil series within the fire area are the Pinehurst, Mojo and Munnel soils, all three are residual soils derived from extrusive igneous rock; primarily basalt flows and colluvium. These soils weather to a loamy soil with variable rock content depending on landscape position.

**Q. Geologic Types:** The area is characterized by a broad undulating volcanic plateau broken by andesitic cinder cones, and basalt flows which are the dominant rock types. The majority of the bedrock within the fire area is composed of basalt associated with Pliocene lava flow eruptions to the west of the fire area. The south and eastern edge of the fire area is composed of Quaternary andesitic cinder cones Horsethief Butte and Mount Hebron. The Tenant burn area ranges in elevations from 4,300 to over 6,100 feet about sea level.

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

*Table 3: Miles of Stream Channels by Order or Class*

STREAM TYPE	MILES OF STREAM
PERENNIAL	1.7
INTERMITTENT	6.5
EPHEMERAL	5.6

**S. Transportation System:**

**Trails:** National Forest (miles): 0

Other (miles): 0

**Roads:** National Forest (miles): 31.6

Other (miles): 6.5

### PART III - WATERSHED CONDITION

**A. Burn Severity (acres):** See Attachment A - Soil Burn Severity

*Table 4: Burn Severity Acres by Ownership*

Soil Burn Severity	NFS	Other Federal (List Agency)	State	Private	Total	% within the Fire Perimeter
Unburned	847	0	0	461	1,308	11
Low	3,356	0	0	1,710	5,066	44
Moderate	3,811	0	0	660	4,471	39
High	570	0	0	97	667	6
<b>Total</b>	<b>8,584</b>	<b>0</b>	<b>0</b>	<b>2,928</b>	<b>11,512</b>	<b>100</b>

**B. Water-Repellent Soil (acres):** 2200 acres – moderate. Field investigation showed that pre-fire water repellency is low in the unburned ponderosa pine forest and slightly increased post-fire. Water repellency is low in the unburned juniper-shrub vegetation and moderately increased by the fire. Water repellency generally decreases with increasing clay content of the soil and the soils in the burned area are loamy with up to 28% clay.

**C. Soil Erosion Hazard Rating:** Erosion hazard is mostly low. Erosion hazard is increased by the loss of soil cover where there is moderate and high severity fire. In this burned area most of the precipitation is snow fall, annual rainfall is low and not intense, therefore erosion hazard remains low for most of the burned area. Compacted road surfaces with runoff from slopes are the main erosion concern.

**D. Erosion Potential:** ERMIT modeling predicts an average erosion for the Tenant Fire burned area of 2.0 tons/ acre for a 5-year erosion event with a range of 0-11 tons/acre. This is a low average post fire erosion rate and low maximum 11 tons/acre. The attached map (Attachment B) displays the spatial distribution of erosion rates. The highest modeled erosion rates occur on the steep east aspect scarp slopes. These slopes are dominated by very high surface rock content deposited by colluvial processes resulting from faulting. Because surface rock provides armoring against erosional processes, it is very likely that both the average and maximum erosion rates are overestimated.

**E. Sediment Potential:** There is low sediment potential.

**F. Estimated Vegetative Recovery Period (years):** 3 to 5 years

**G. Estimated Hydrologic Response (brief description):** Doubling in hydrologic response for a 2 year event. Modeling for a drainage that crosses road 45N25 indicates the 2-year event flow event is 3.5 cfs. The area is a mix of moderate and high soil burn severity. Post fire the model predicts flows of approximately 10.6 cfs, an increase of three times. However the area is rocky which would break up any flows and runoff velocity, and the soils have a high infiltration rate. The model possibly over-predicts the response and conditions on the ground suggest response would double.

## PART V - SUMMARY OF ANALYSIS

### Introduction/Background

The Tennant Fire ignited on June 28<sup>th</sup>, 2021 near the intersection of Tennant Road and Highway 97. The fire burned 10,580 acres in a mix of timber and brush stands dominated by Ponderosa pine in the upper elevations and juniper, sagebrush, bitterbrush, and grasses in the lower elevations. The fire burned in a mix of private land and National Forest System (NFS) lands on the Klamath National Forest.

State Highway 97 bisects the fire, and there are another 32 miles of NF system roads in the assessment area. Burn severity was 11% very low or unburned, 44 % low, 39% moderate, and 6% high.

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

Table 5: Critical Value Matrix

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

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

**Hazard trees and road conditions:** There is a very high density of hazard trees along NF system roads where there would be much local traffic for firewood and recreation. The extent of hazard trees along roads and the possible amount of local traffic makes the probability of injury, or stranding, or other safety risk **likely**. The magnitude of consequences would be **major**. The risk for life and safety is **Very High**.

- BAER funds are requested to treat these risks (*Treatment HLS-1*).

#### 2. Property (P):

**NFS Roads:** There are 23.3 miles of Forest Service system roads within the Tennant Fire Assessment Area. Of these, 4.2 miles of Forest Service system roads were found within or downslope of areas of high or moderate burn severity. These miles are considered at risk to damage from post-fire increases through increased runoffs, debris, and sediment transport. Engineering assessment team prioritize the road miles as follows:

- 19.1 miles were found to be located in or near ridgetops, dead-end routes, or through routes that are redundant or parallel to another route. These roads may have **unlikely** probability of damage and have **minor** magnitude of consequence, resulting in **Very Low Risk**.
- 4.2 miles were found to be associated with high and moderate SBS with significant upslope source area that will result in increased runoff, resulting in **likely** probability of

damage. These roads are necessary for forest management. They provide access to recreation and private land. Damage to these routes would have a **moderate** magnitude of consequence, resulting in **High Risk**.

- BAER funds are requested for stormproofing on 2.48 miles of the road miles determined to be High Risk (*Treatment RD-1*)
- BAER funds are requested for storm patrol on the 4.2 miles of the road miles at High Risk (*Treatment RD-2*).

### 3. Natural Resources (NR):

**Native Plant Communities:** It is **likely** that invasive species were spread into un-infested, native plant communities through: (1) the disturbance of known noxious weeds adjacent and within the burn area, and (2) the exposure of open, bare ground that is now vulnerable to invasion. The consequences are **moderate** because spread and introduction of noxious weeds would cause long-term damage to the critical natural resource values associated with native plant communities. The risk rating is **High**.

- This emergency will be treated by the local botanist already funded. No BAER funds are requested.

### 4. Cultural and Heritage Resources:

Potential Values at Risk in the burned area were identified prior to the on-the-ground survey and include:

- Prehistoric artifact scatters
- Prehistoric rock features
- Historic sawmills
- Historic railroads
- Historic log chutes
- Historic artifact scatters
- Historic trails

These resources are at some risk of looting, erosion by water or wind, and collapse into stump holes. The ashy footprint of wooden features that burned will disappear along with the information it provided. Based on the likelihood of occurrence and magnitude of loss, the assessment concluded for all sites reviewed that risks were **Low** or **Moderate**. Recommendations were made to the forest for monitoring, recording, or other protection. No BAER project is requested.

## B. Emergency Treatment Objectives:

1. **Human Life and Safety:** Protect human life and safety by forest or road closure and/or warning signs.
2. **Property - NFS Roads:** Protect roads by maintaining drainage and controlling runoff. Do preventative maintenance to avoid greater damage and costs.
3. **Natural Resources – Native Plant Communities:** Detect invasive plants early and respond rapidly so as to avoid establishment and infestation of noxious weeds in native plant communities.
4. **Cultural and Heritage Resources –** No emergency treatments are proposed.

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

Land NA

Channel NA

Roads/Trails 90%

Protection/Safety 90%

## D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land	na	na	na

	<b>1 year after treatment</b>	<b>3 years after treatment</b>	<b>5 years after treatment</b>
<b>Channel</b>	na	na	na
<b>Roads/Trails</b>	85	90	90
<b>Protection/Safety</b>	90	90	90

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

Human Life and Safety: There is no market value for human life and safety, but an injury could exceed \$1,000,000, providing substantial benefit/cost ratio.

Property: The cost to rebuild sections of the road if washed out, eroded, or buried includes estimates to bring in material to build up the damaged roads. The cost of not treating the proposed 4.2 miles of road under moderate to high burn severity is approximately \$124,500 not including the effect on forest management, fire suppression, and recreation.

Natural Resources – Native Plant Communities: There is no market value for native plant communities. It is fair to say that eradication of invasives after establishment and spread exceeds the cost of eradication at the initial introduction.

Cultural and Heritage Resources: Risks were Low or Moderate and treatment measures were recommended for the forest.

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

HLS1: The cost for warning signs is \$5500. Detail costs are included in the assessment project record Engineering Report.

<b>Life and Safety Treatment Costs</b>	<b>Unit</b>	<b>Quantity</b>	<b>Cost/Unit</b>	<b>Total Cost</b>
Hazard warning signs	Each	11	\$500	\$5,500

RD1: The cost to treat 4.2 miles of road within the assessment area is \$10,545. Detail costs are included in the assessment project record Engineering Report.

<b>Road Treatment Costs</b>	<b>Unit</b>	<b>Quantity</b>	<b>Cost/Unit</b>	<b>Total Cost</b>
Storm Proofing	Mile	2.48	\$1728	\$4320
Storm Inspection and Response	Mile	4.15	\$1,500	\$6,225

NR1: The BAER cost for EDRR treatment of weeds is \$0 for either suppression related or fire related weed introductions or spread. This work is already planned to be completed by the district botanist who is fully funded due to budget modernization.

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

- |   |   |   |   |   |
|---|---|---|---|---|
| <input checked="" type="checkbox"/> Soils | <input checked="" type="checkbox"/> Hydrology | <input checked="" type="checkbox"/> Engineering | <input checked="" type="checkbox"/> GIS | <input checked="" type="checkbox"/> Archaeology |
| <input checked="" type="checkbox"/> Weeds | <input type="checkbox"/> Recreation           | <input type="checkbox"/> Fisheries              | <input type="checkbox"/> Wildlife       |   |
| <input type="checkbox"/> Other:           |   |   |   |   |

**Team Leader:** Jeff TenPas, Brad Rust

**Email:** brad.rust@usda.gov

**Phone(s):** 530-226-2427

**Forest BAER Coordinator:** Brad Rust

**Email:** brad.rust@usda.gov**Phone(s):** 530-226-2427**Team Members:***Table 7: BAER Team Members by Skill*

Skill	Team Member Name
<i>Team Lead(s)</i>	Jeff TenPas, Brad Rust
<i>Soils</i>	Eric Nicita, Jeff TenPas
<i>Hydrology</i>	Bill Goodman, Jesse Merrifield
<i>Engineering</i>	Alvin Sarmiento, Molly Breitman, Ben Molitor, Larry Arrington
<i>GIS</i>	Jonna Cooper, Matt House
<i>Archaeology</i>	Laird Naylor
<i>Weeds</i>	Erin Lonergan
<i>Range</i>	Dani Balin
<i>Geology</i>	Dennis Veich, Yonni Schwartz, Derek Beal
<i>Admin/Logistics</i>	Cathy Carlock

**H. Treatment Narrative:****Land Treatments:****NR-1 EDRR for Weeds**

Early detection surveys will be completed by the district botanist during planning phases for salvage logging of the Tennant fire area. Native seed will be used to reduce the risk of cheat grass spread.

**Channel Treatments:** None**Roads and Trail Treatments:****RD-1 Stormproofing**

In and downslope of the moderate and high burn severity areas construct dips on steep road sections. Improve ditches to provide relief in the occurrence of storm events at various locations along the road length to allow drainage of the road surface and minimize erosion.

**RD-1 Storm Inspection and Response**

Other roads not included in stormproofing that are in moderate burn severity need to be monitored during and after storm events. Storm inspections and response will 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 runoff and sediment delivery.

**Protection/Safety Treatments:****HLS-1 Entering Burn Area Warning Signs**

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 burned areas.

**I. Monitoring Narrative:** None proposed.

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

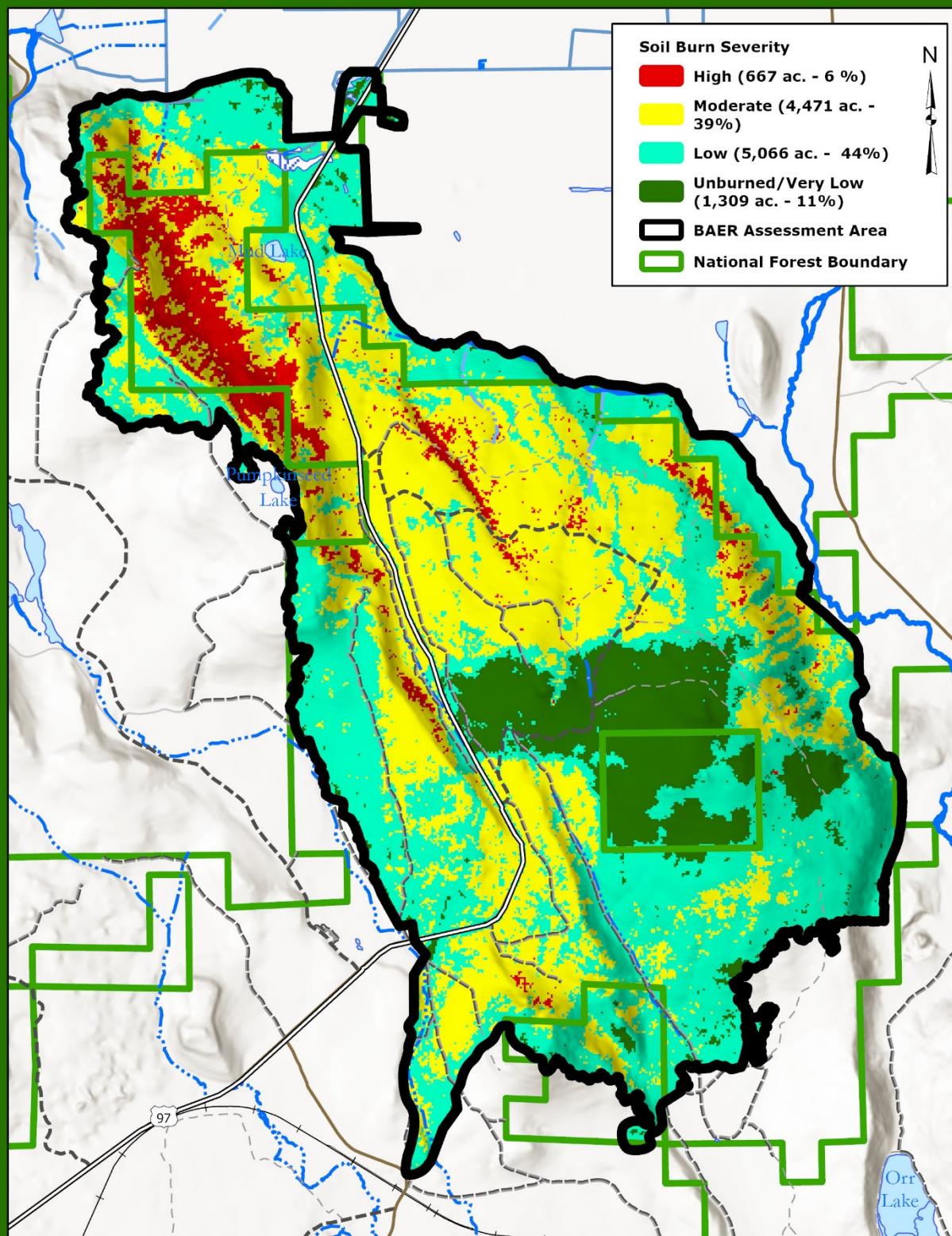
Line Items	Units	Cost	NFS Lands			Other Lands				All \$
			# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	
<b>A. Land Treatments</b>										
EDRR (no BAER cost)				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Land Treatments</b>				<b>\$0</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$0</b>
<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
<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>										
Stormproofing (RD-1)	mile	1,500	2.48	\$3,720	\$0		\$0		\$0	\$3,720
Construct dip (RD-1)	Each	600	1.00	\$600	\$0		\$0		\$0	\$600
Storm patrol (RD-2)	mile	1,500	4.15	\$6,225	\$0		\$0		\$0	\$6,225
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Road and Trails</b>				<b>\$10,545</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$10,545</b>
<b>D. Protection/Safety</b>										
Warning signs	Each	500	11	\$5,500	\$0		\$0		\$0	\$5,500
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Protection/Safety</b>				<b>\$5,500</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$5,500</b>
<b>E. BAER Evaluation</b>										
Initial Assessment	Report	\$30,154	1		\$0		\$0		\$0	\$0
					\$0	\$0	\$0	\$0	\$0	\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
<b>Subtotal Evaluation</b>				<b>\$0</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$0</b>
<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
<b>Subtotal Monitoring</b>					<b>\$0</b>	<b>\$0</b>	<b>\$0</b>		<b>\$0</b>	<b>\$0</b>
<b>G. Totals</b>				<b>\$16,045</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$16,045</b>
Previously approved										

**PART VII - APPROVALS**

1.

Forest Supervisor

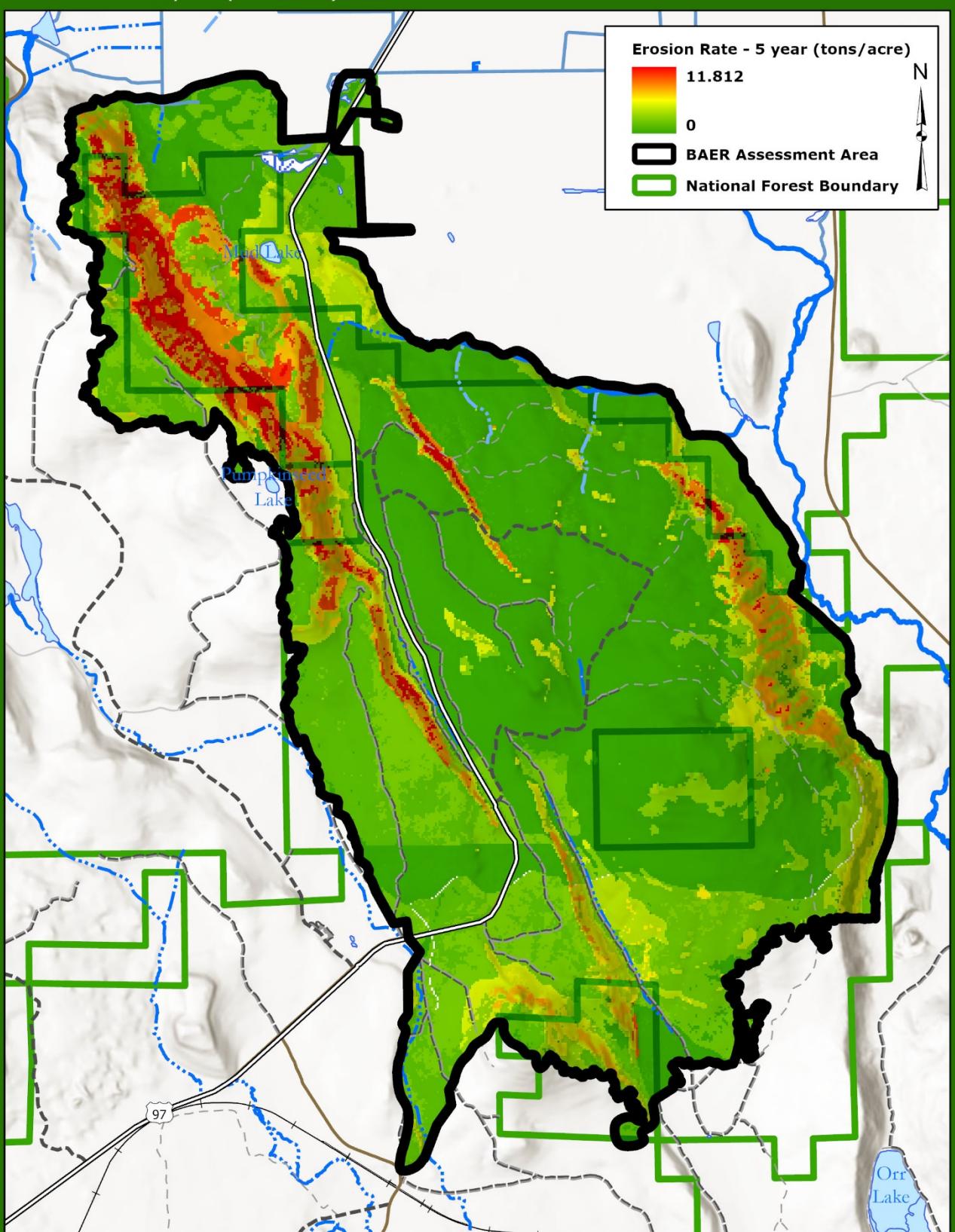
Date

**Tennant Fire BAER Assessment***Soil Burn Severity*

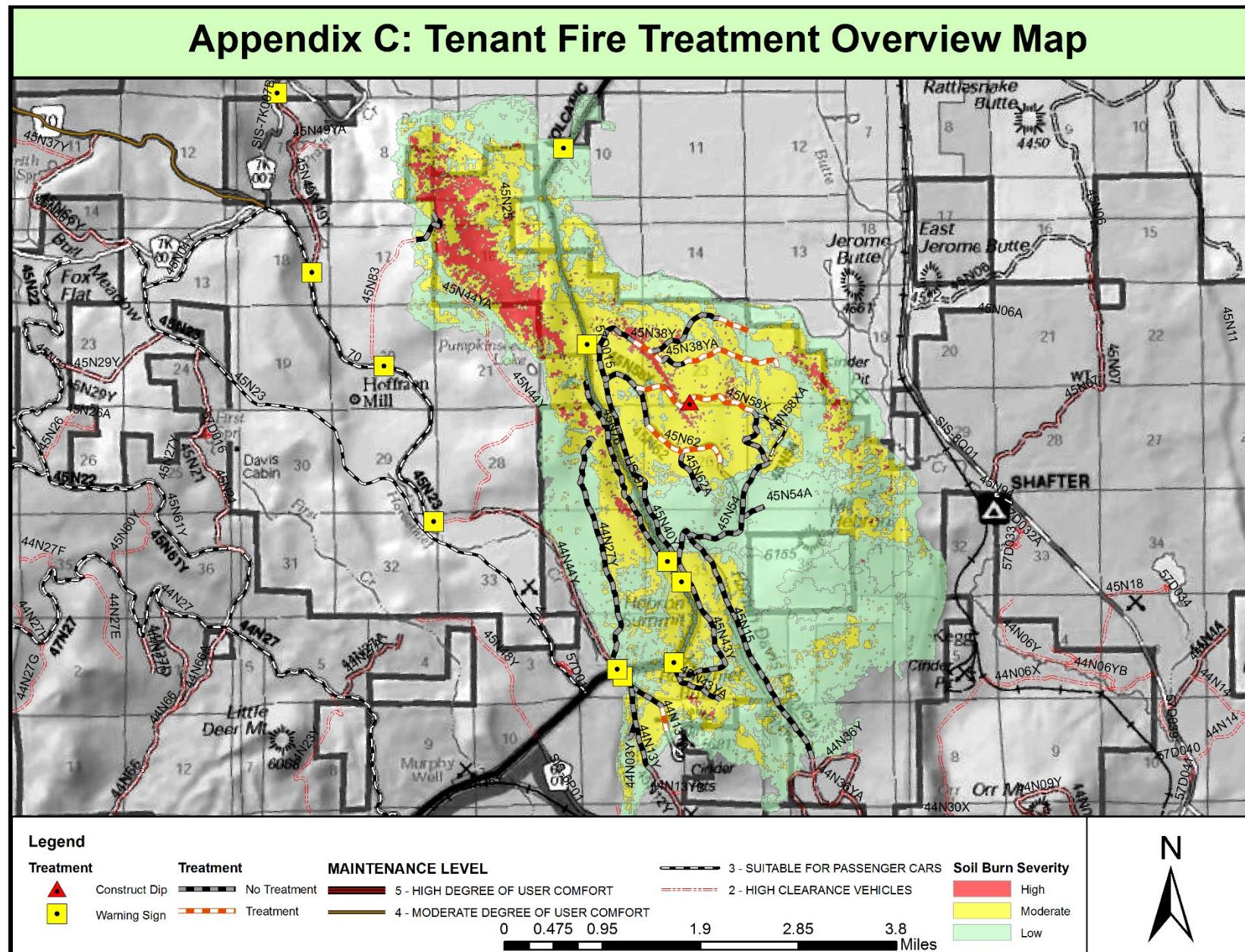
0 1 2 Miles

**Tenant Fire BAER Assessment**

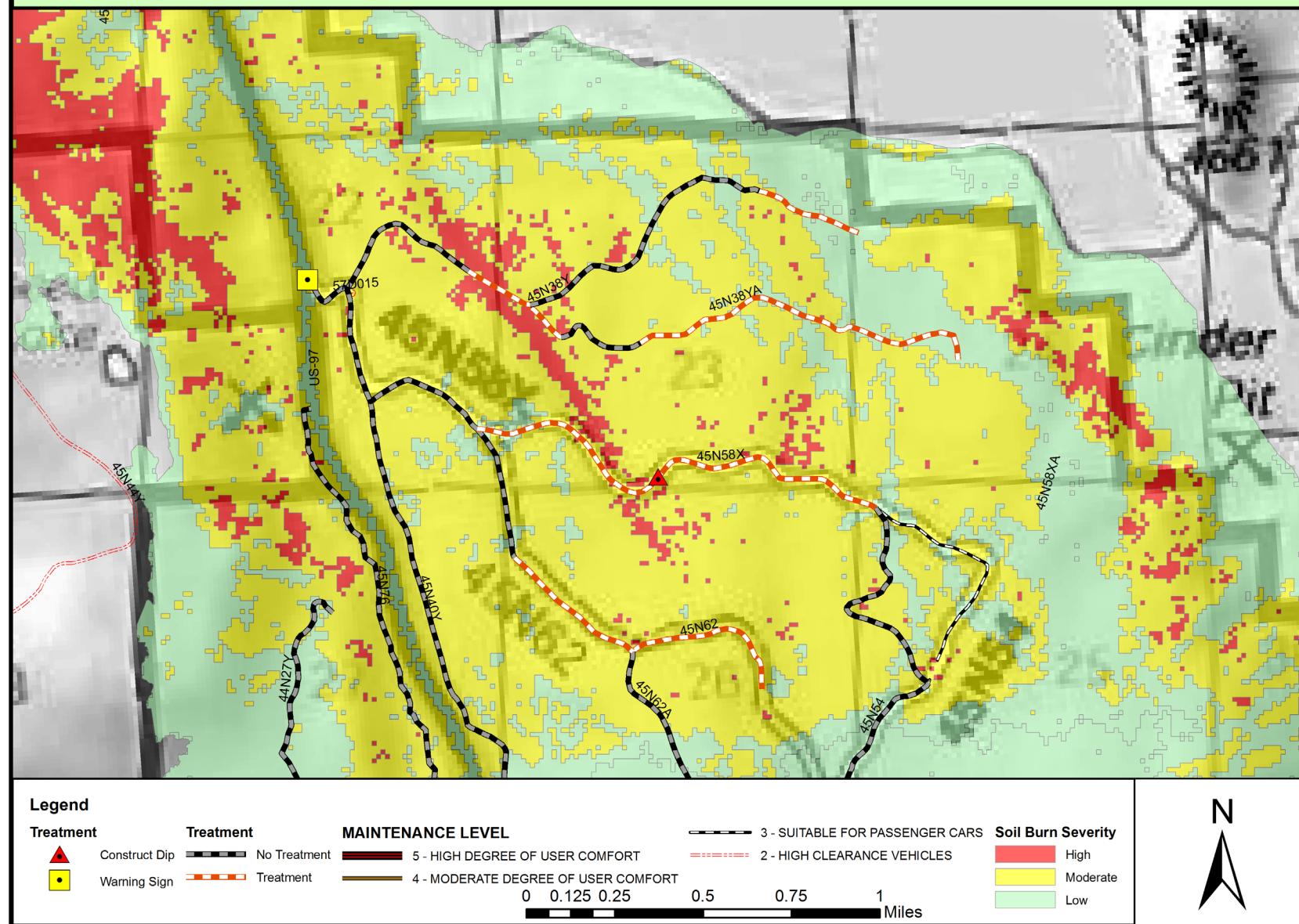
Erosion Risk - 5 year (tons/acre)



## APPENDIX C: TREATMENT MAPS



## Appendix C: Tenant Fire Treatment Area Map 1



## Appendix C: Tenant Fire Treatment Area Map 2

