Date of Report: 10/9/2021

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: Antelope

B. Fire Number: CA-KNF-006454

C. State: California

D. County: Siskiyou

E. Region: R5 Pacific Southwest Region

F. Forest: Klamath, Modoc, Shasta-Trinity

G. District: Goosenest, Doublehead, McCloud

H. Fire Incident Job Code: P5N7H2 (0505)

I. Date Fire Started: 08/01/2021

J. Date Fire Contained: 95% on 10/7/2021

K. Suppression Cost: $71,799,049 on 10/7/2021

L. Fire Suppression Damages Repaired with Suppression Funds (estimates) as of 10/7/2021:

1. **Fireline repaired:** 72.1 miles of dozer line; 1.9 miles of hand line
2. **Fireline not yet repaired:** 228.8 miles of dozer line; 37.5 miles of hand line

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
180102041301	Tamarack Flat	10,554	9,328	88%
180102050202	Antelope Creek	39,554	33,635	85%
180102041302	Three Sisters	34,584	25,106	73%
180102050104	Pollic Flat	11,975	7,596	63%
180102041401	Sheep Camp Butte	31,261	16,166	52%
180200040103	Trout Creek	18,658	8,678	47%
180102050201	Garner Mountain-Long Prairie	20,700	9,439	46%
180102041303	Willow Creek	40,757	15,985	39%
180102041402	Town of Laird Landing	33,450	8,303	25%

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
180102041003	Robinson Flat-Tule Lake	38,740	4,281	11%
180102050105	Lower Butte Creek	33,111	3,178	10%
180200030401	Harris Spring	18,376	1,361	7%
180102050102	Upper Butte Creek	37,251	1,695	5%
180102050101	Blue Canyon	13,144	297	2%
180200030305	Grasshopper Flat	40,785	751	2%
180102041001	The Panhandle	48,349	861	2%
180200040105	Dry Creek	27,829	18	<1%
180200040104	Edson Creek	18,856	2	<1%

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	111,457
NPS	12,796
BLM	2
STATE	0
PRIVATE	22,424
TOTAL	146,679

O. Vegetation Types: The Antelope fire burned through vegetative communities ranging in elevation from approximately 4,000 feet to over 8,000 feet. This dramatic elevation gradient spans many different habitat types. Low areas of the fire area are dominated by western juniper and ponderosa pine, with understories of sagebrush, bitterbrush, and mountain mahogany. As elevation increases the habitat transitions from pine to mixed conifer forest of Douglas fir, lodgepole pine, white fir, and incense cedar, transitioning to Shasta red fir, and hemlock forest, and finally to the climax species before true alpine and whitebark pine. Understories for higher elevational forests are primarily comprised of green leaf, pinemat manzanita, and snowbrush.

P. Dominant Soils:

Table 3: Antelope BAER Analysis Area Soils

Soil Taxonomy	Acres	Percent_Area
Loamy-skeletal, mixed, frigid Andic Xerochrepts	26511	18.07
Loamy-skeletal, mixed, frigid Ultic Haploxeralfs	23481	16.01
Medial-skeletal, frigid Andic Xerumbrepts	17877	12.19
Not classified	11885	8.10
Medial-skeletal, frigid Andic Xerochrepts	10138	6.91
Fine-loamy, mixed, frigid Ultic Argixerolls	9110	6.21
Loamy-skeletal, mixed, mesic Lithic Haploxerolls	9017	6.15
Fine-loamy, mixed, frigid Mollic Haploxeralfs	7259	4.95
Loamy, mixed, mesic Lithic Argixerolls	5305	3.62
Clayey-skeletal, smectitic, mesic Aridic Argixero*	4518	3.08
Cindery over medial-skeletal, frigid Dystric Xero*	3259	2.22
Loamy-skeletal, mixed, mesic Aridic Argixerolls	2784	1.90
Ashy-skeletal, mixed, frigid Dystric Xerorthents	2451	1.67
Loamy-skeletal, mixed, mesic Xerollic Haplargids	2375	1.62

Soil Taxonomy	Acres	Percent_Area
Fine, smectitic, mesic Aridic Argixerolls	2298	1.57
Fine-silty, mixed, frigid Cumulic Haplaquolls	2006	1.37
	140275	**95.63**

Q. Geologic Types:

Table 4: Antelope BAER Analysis Area Geologic Types

Map Unit	UNIT_AGE	ROCKTYPE1	ROCKTYPE2	Acres	Percent Area
169	Quaternary	andesite	basalt	69362	47
150	Holocene	andesite	dacite	26397	18
349	Quaternary	andesite	basalt	17949	12
300	Holocene	andesite	dacite	13971	10
222	Quaternary	andesite	rhyolite	8568	6
106	Quaternary	andesite	basalt	4374	3
312	Holocene	andesite	dacite	3163	2
298	Tertiary (2-24 Ma)	andesite	basalt	1252	1
225	Holocene	andesite	dacite	933	1
129	Quaternary	andesite	basalt	651	<1
398	Pliocene to Holocene	alluvium	terrace	58	<1

R. Miles of Stream Channels by Order or Class:

Table 5: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	26
INTERMITTENT	129
EPHEMERAL	45

S. Transportation System:

Trails: *National Forest (miles):* 80 *Other (miles):* Not Reported

Roads: *National Forest (miles):* 443 *Other (miles):* 33

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 6: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	NPS	BLM	Private	Total	% within the Fire Perimeter
Unburned	22,662	4,181	2	6,212	33,057	22.5%
Low	38,173	7,554	<1	7,563	53,290	36.3%
Moderate	40,865	1,061	0	7,311	49,237	33.6%
High	9,757	0	0	1,338	11,095	7.6%
Total	111,457	12,769	2	22,424	146,679	100%

B. **Water-Repellent Soil (acres):** The extent of fire induced water repellent soils is estimated to be at least 17,856 acres or 50% of the high and 25% of the moderate burn severity areas. Observations indicated strong repellency frequently occurred directly below the layer of fire impacted soil in both forest and shrub dominated areas. Fire impacted soil was often measured to be approximately 1 inch deep but was variable. The pattern of water repellent soils appears to be generally uniform. Water repellency was also observed in unburned areas. Increased runoff due to hydrophobic conditions, reflected in the hydrologic and debris flow modelling, is one of the factors that drives increases in hillslope rill and sheet erosion. Hydrophobic layers will usually take six months to two years to break down. Plant root development, soil microbial activity, and freeze-thaw cycling all contribute to the degradation of hydrophobic conditions.

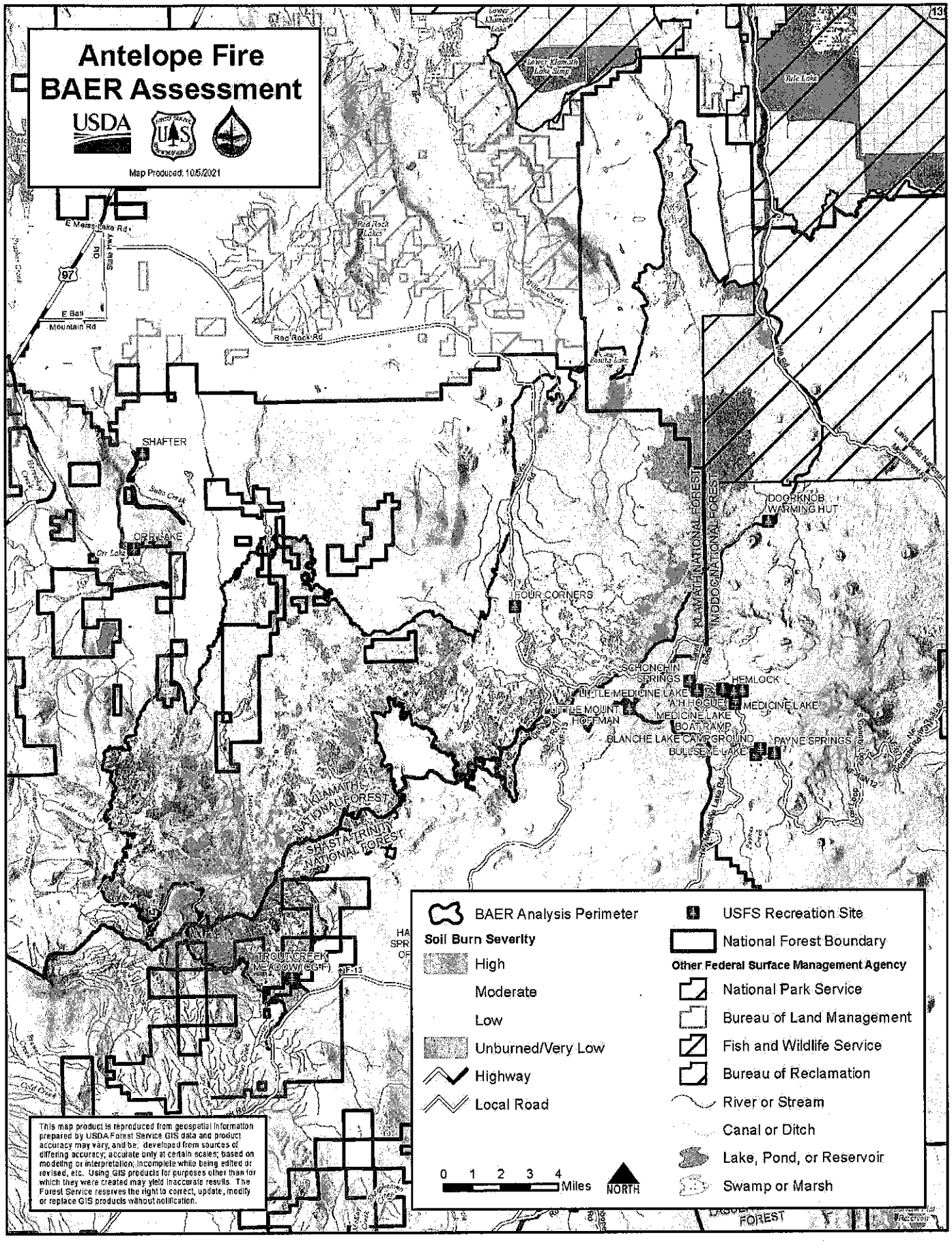


Figure 1: Antelope Fire Soil Burn Severity

C. Soil Erosion Hazard Rating: Pre-fire erosion hazard for burned area soils was obtained from existing soil survey erosion hazard rating information. The EHR interpretation is based on soil properties such as soil texture, slope, aggregate stability, infiltration rate, subsoil permeability, depth to restrictive layers, and soil rock content. Actual pre and post fire erosion potential is better reflected by the ERMiT modeling runs for this project.

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope, soil erosion factor K, and an index of rainfall erosivity (R). The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and "severe" indicates that erosion is very likely; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely.

Table 7: Pre-fire Erosion Hazard Ratings

Erosion Hazard Rating	Acres	Percent Area
Not rated	11885	8
Slight	86559	59
Moderate	24040	16
Severe	24135	16
Very Severe	60	0

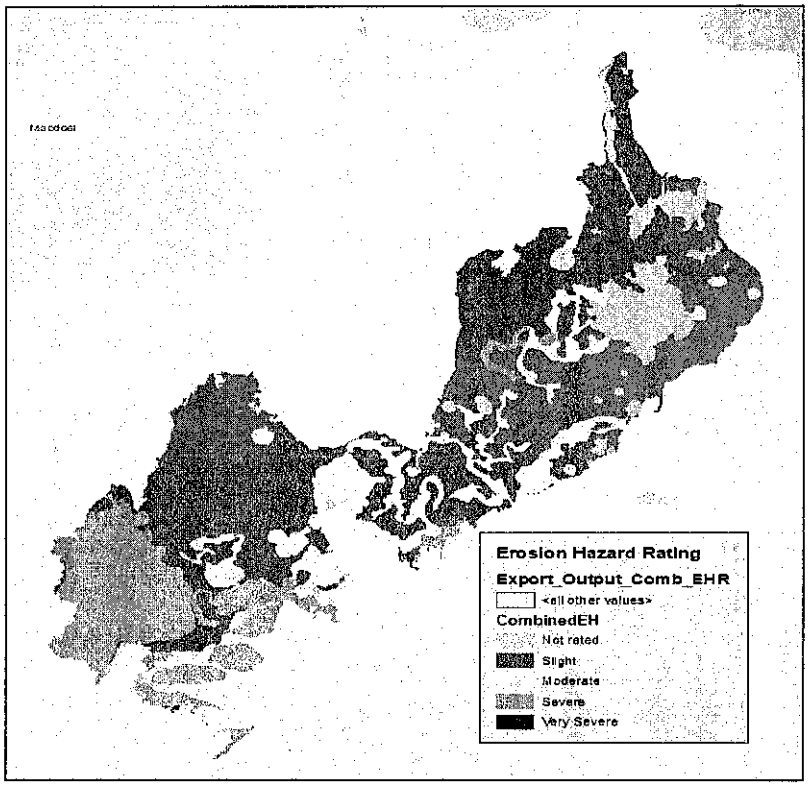


Figure 2: Pre-fire erosion hazard ratings

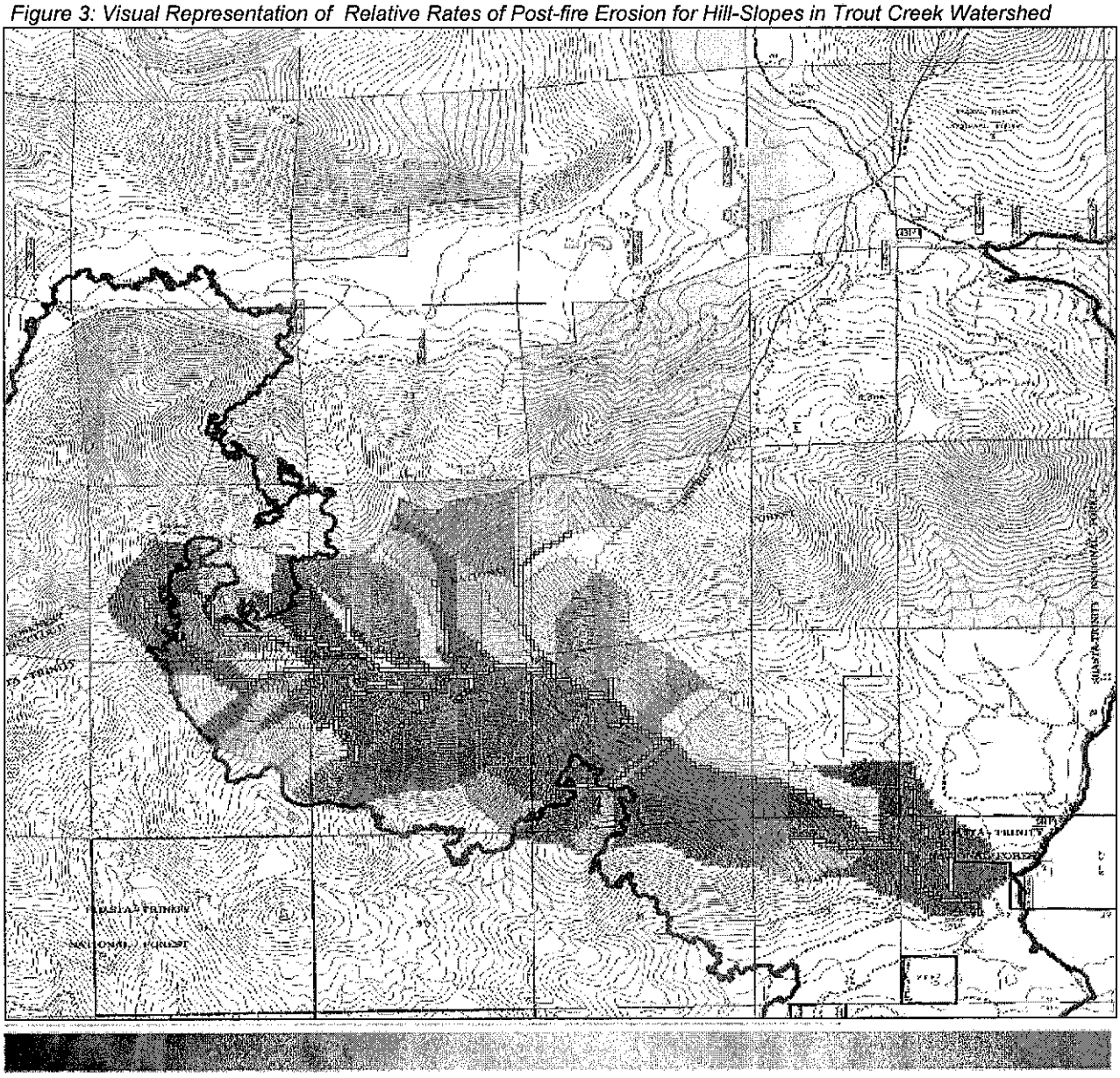
D. Erosion Potential:

After conducting an initial analysis of soil burn severity, slope steepness, USGS debris flow model outputs, and identification of areas of concern and BAER critical values, WEPP-Cloud soil erosion modelling was conducted in the Antelope and Trout Creek watersheds.

WEPP Cloud model results indicate that rates of erosion are very low (generally close to zero) in unburned densely forested areas. Rates of erosion will increase significantly to on steep forested and shrub dominated hillslopes that were mapped at high soil burn severity. Extensive removal of forest floor ground cover occurred in these areas. Recovery to approximate pre-fire rates of these areas is likely to occur within 3-5 years following the burn.

Erosion rates shown in Figure 3 range from close to 0 tons/acre(dark green areas) up to 2.8 tons/acre (red areas). Similar rates of erosion were modelled in steep burned areas in Antelope Creek. The map is most useful for considering relative differences rather than absolute values.

Figure 3: Visual Representation of Relative Rates of Post-fire Erosion for Hill-Slopes in Trout Creek Watershed



Higher Erosion **Lower Erosion**

E. Sediment Potential: Sediment potential for the entire burned area, based on low erosion and sediment delivery rates overall, is estimated to be less than 640 cubic yards/square mile.

F. Estimated Vegetative Recovery Period (years): 3-5 years for shrubs and forest understory, 20 years for forest overstory.

G. Estimated Hydrologic Response (brief description):

Hydrologic response is estimated by assuming an increased runoff commensurate with soil burn severity in terms of recurrence interval. This recurrence interval estimates the response of the newly burned landscape to the design flood event. The Antelope Fire is expected to respond to an average rainfall event differently for the unburned, low, moderate, and high soil severity burned areas.

A 2-year return interval peak flow (Q2) was used as a conservative estimate of a peak flow magnitude that could be potentially damaging and has a high likelihood of occurrence within the next 1-4 years, when the watersheds are most susceptible to elevated peak flows and erosion. A 2-year peak flow event has a 50% probability of occurrence in any given year and a 94% probability of occurring at least once over the next 4 consecutive years. Modeling pre- and post-fire peak flow involves uncertainty; modeled flows should be considered estimates of the relative expected change in post-fire hydrologic response which are used to help identify areas of concern and prioritize treatment. Design flow estimates for the Antelope Fire have been based on U.S. Geological Survey regression equations for the burned area.

Adjusted design flow is calculated using the same relationships as design flow; however, runoff response is estimated by assuming an increased runoff commensurate with soil burn severity in terms of flood recurrence interval. The Antelope Fire is expected to respond to an average rainfall event differently for the unburned, low, moderate, and high soil severity burned areas. Post fire Q2 hydrologic modeling was conducted based on the assumption that areas of low SBS would remain unchanged, areas of moderate SBS would respond according to the pre-fire Q5, and areas of high SBS would responding according to pre-fire Q10. The cfs/sq mi for each flood event was aggregated based on observed soil burn severity in the modeled drainage, with the end result being an expected percent increase in post-fire Q2 discharge.

Post-fire peak flow for Antelope Creek was modeled from the headwaters to a pour point just above Tennant, CA. The 2-year post-fire peak flood is expected to increase by 54%. When a sediment bulking factor was applied to the post-fire discharge calculation the expected increase over pre-fire conditions is 98%. It is worth noting the sediment bulked post-fire 2-year flood event is only slightly larger than the pre-fire 5-year flood event that was calculated using USGS regression equations.

Post-fire peak flow for Trout Creek was modeled from the headwaters to a pour point just above the Trout Creek Meadow CG. The 2-year post-fire peak flood is expected to increase by 44%. When a sediment bulking factor was applied to the post-fire discharge calculation the expected increase over pre-fire conditions is 75%. It is worth noting the sediment bulked post-fire 2-year flood event is only slightly larger than the pre-fire 10-year flood event that was calculated using USGS regression equations.

USGS post fire debris flow threat models estimate a variable level of debris-flow hazard for most of the area burned by the Antelope fire. Most stream reaches and drainage basins have a less than 40% likelihood of debris-flow occurrence at the modeled rainfall intensity, but drainages with moderate to high levels of debris-flow hazard are locally common. Areas that have a high (60-80%) to very high (>80%) likelihood of producing debris flows occur above some stretches of Trout and Antelope Creeks. Sections of Haight Mtn Road, Rainbow Road, Baird Springs Road, Antelope Creek Road, and multiple unnamed Forest Service Roads (44N01, 43N03, 44N77, 44N05) also occur in high hazard areas. Most of the burned area requires rainfall rates greater than 32 mm/h to exceed a 50% likelihood of debris-flow occurrence. Higher hazard areas require more modest rainfall rates between 12 and 24 mm/h to exceed a 50% likelihood of debris flow occurrence. Most watersheds are estimated to produce volumes between 1,000-10,000 m^3, resulting in a low to moderate combined debris-flow hazard for most of the burn area.

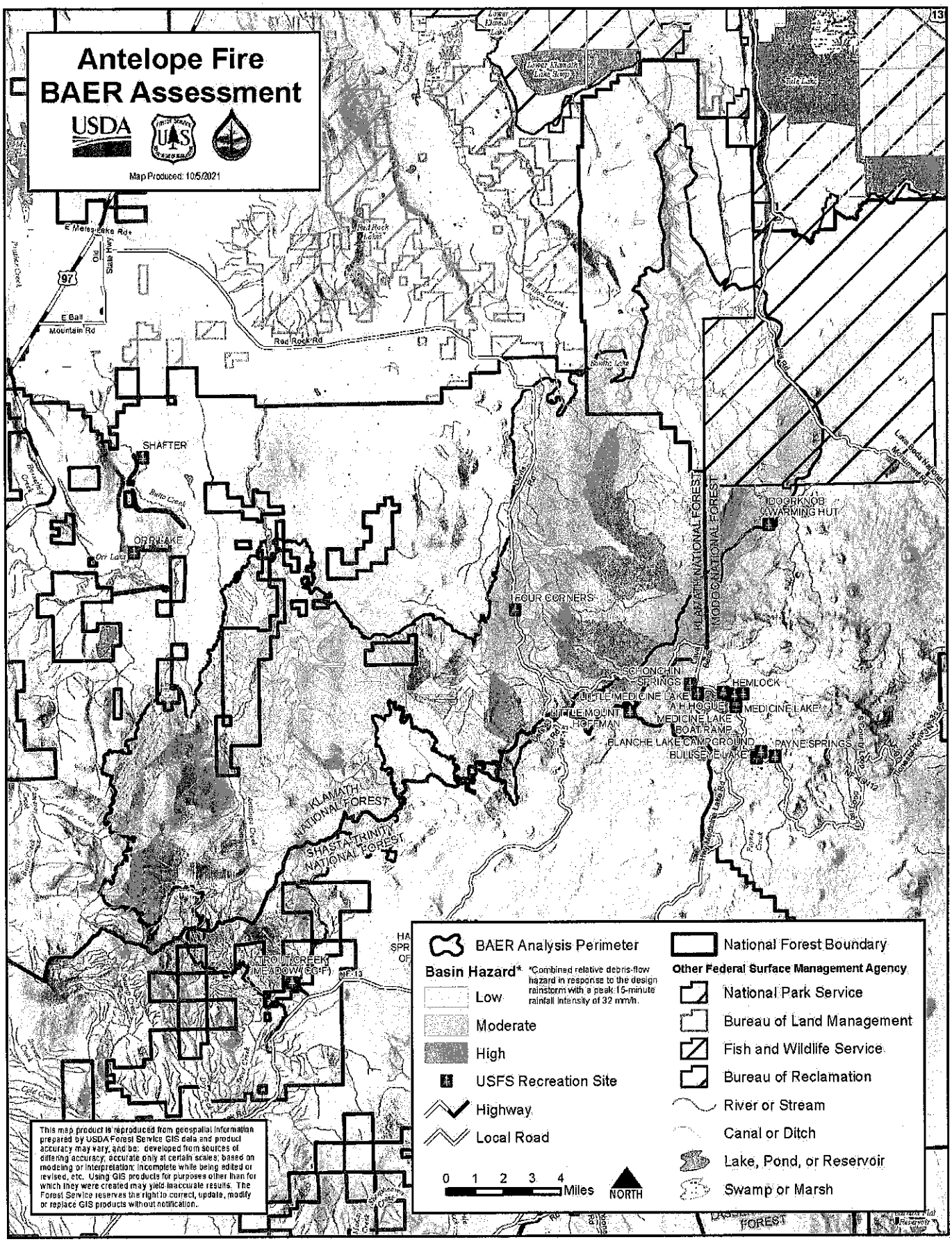


Figure 4: Antelope Fire Debris Flow Hazard at a peak 15-minute rainfall intensity of 32mm/hour

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The lightning caused Antelope Fire was first detected on August 1, 2021. Fire spread was significant during the first week following the ignition with daily growth peaking at 18,500 acres on August 4th. After the first week, fire activity began to moderate until the second week of September when fire activity significantly increased and daily growth reached approximately 24,000 acres on September 12th. The 146,679 acre BAER analysis perimeter was created by the US Forest Service Geospatial Technology and Applications Center using the incident perimeter and modifying it slightly to more accurately reflect the extent of the burned vegetation as observed by the Landsat satellite.

The USFS BAER team began its assessment of the burnscar on September 28th. Soil Burn Severity (SBS) mapping was accomplished by ground truthing an initial Burned Area Reflectance Classification (BARC) map using the methods outlined in RMRS-GTR-24, resulting in a final field validated soil burn severity map. Additional field review and identification of watershed response threats, hazards to human life and safety, threats to the NFS road system, threats to soils and water quality, and threats native vegetation communities, were identified by the Unit BAER Coordinators, Line Officers, and the BAER survey team.

The remainder of this report will focus on threats to Critical BAER values identified in FSM 2523 – Emergency Stabilization – Burned Area Emergency Response. Risks to Critical BAER Values were calculated using the following BAER risk assessment matrix and additional guidance from FSM2523.

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

Table 8: 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):

a. Human life and safety of Forest visitors and employees traveling on NFS roads, trails, traveling cross country, or dispersed camping in the burn scar is threatened due to the potential for injury or loss of life from hazard tree strikes, falling rocks, flash floods, debris flows, and other burned area hazards. The probability of damage or loss is **likely** as the NFS transportation system contains many motorized and non-motorized routes adjacent to and through the burned area. The magnitude of consequence is **major** since an overhead hazard strike, entrapment in a flood or debris flow, or motorized vehicle collision with downed trees or fallen rocks could result in serious injury or loss of life. The risk level is **very high**. BAER treatments are recommended. See treatments P1a.

b. Human life and safety of Forest Visitors camping at Trout Creek Meadow Campground is threatened by the potential for flash flooding and debris flow impacts originating from upstream burned areas. The probability of damage or loss is **possible** because the campground is located adjacent to Trout Creek and expected increases in post-fire flood discharge may inundate some of the campsites or trap campers if significant road damage occurs during flood events. The magnitude of consequence is **major** because serious injury or loss of life could result if flash flooding were to occur when campers are asleep and unaware of the need to evacuate to higher ground. The risk level is **high**. Administrative closures are recommended.

2. Property (P):

a. Portions of the NFS road network within and downslope/downstream of the burn scar are threatened by expected increases in postfire runoff following high intensity precipitation events. The probability of damage or loss is **likely** because many of the existing drainage structures on the threatened segments are not sized to pass the increased post-fire runoff and portions of the roads are adjacent to steep stream banks which are expected to erode during post-fire flash flood events. The magnitude of consequence is **moderate** because many of the threatened routes have significant drainage, fill, and surfacing investments that could be damaged or lost due to increased post-fire runoff and loss of control of water. Many of the threatened routes require BAER treatments to ensure continued motorized access to private inholdings. The risk level is **high**. Treatments are recommended. See treatments RT1a, RT1b, RT2, RT5, RT7, and RT15.

3. Natural Resources (NR):

a. Water on NFS lands that is used for municipal, domestic, and agricultural supply is threatened by potential water quality degradation following storm events that are expected to transport ash, soil, nutrients, and other non-point source pollutants from burned hillslopes into the receiving water bodies. The probability of damage or loss is **likely** because peak flow and debris flow threat analyses demonstrate that there is high probability of increased watershed response to high intensity rainstorms within the burned watersheds. The magnitude of consequence is **minor** because impacts to water quality that could temporarily impair beneficial uses are expected to be localized and recoverable events in this fire adapted ecosystem. The risk rating is **low.** BAER treatments are not recommended.

b. Soil productivity and hydrologic function on NFS lands are threatened by increased runoff and erosion. While a proportion of eroded soil will remain on the hillslopes, delivery of eroded soil to stream channels could occur. The probability of damage of loss is **likely** because consumption of ground cover by the fire was extensive within the moderate and high soil burn severity areas, rendering the soils vulnerable to high rates of post fire erosion on higher angle slopes. The magnitude of consequence is **minor** because any soil damage is expected to be recoverable and localized. Although impacted by soil heating and erosion, soil productivity and hydrologic function are expected to recover and support the fire adapted ecosystem. The risk rating is **low**. BAER treatments are not recommended.

c. Native or naturalized plant communities on NFS lands where invasive species or noxious weeds are absent or present in only minor amounts are threatened by the potential for introduction of weeds in areas disturbed by suppression activities. The probability of damage or loss is **likely** because newly disturbed areas are susceptible to weed invasion, there was a lack of weed mitigation tactics in place for arriving resources, and known populations of noxious weeds (Canada Thistle, hounds tongue, and Dalmatian toadflax) were disturbed during line construction activities. The magnitude of consequence is **moderate** because spread and introduction of invasive species will cause long-term damage to the critical natural resource values associated with native and sensitive plant communities. The risk rating is **high**. BAER treatments recommended. See treatment L1b.

d. Native or naturalized communities on NFS lands where invasive species or noxious weeds are absent or present in only minor amounts are threatened by the potential for introduction of weeds in areas disturbed wildfire effects. The probability of damage or loss is **likely** because invasive annual grasses (cheatgrass and medusa head) are expected to spread into moderate and high severity burn areas due to the loss of vegetative cover, loss of competing native plant communities, and creation of disturbed vulnerable habitat that is prime for invasion. The magnitude of consequence is **moderate** because spread and

introduction of invasive species will cause long-term damage to the critical natural resource values associated with native and sensitive plant communities. The risk rating is **high**. Natural recovery is recommended because one year of BAER funded manual rapid response treatments would not be a practical or effective treatment for control of invasive annual grasses.

4. **Cultural and Heritage Resources:** Not assessed during the initial BAER survey.

B. Emergency Treatment Objectives: Raise awareness of post-fire hazards throughout the burned area, minimize post-fire damage to NFS road infrastructure, minimize the spread of noxious weeds in areas disturbed by fire suppression activities.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: 80%
Channel: N/A
Roads/Trails: 75%
Protection/Safety: 95%

D. Probability of Treatment Success

Table 9: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land	85%	90%	90%
Channel	N/A	N/A	N/A
Roads/Trails	80%	90%	90%
Protection/Safety	90%	80%	70%

E. Cost of No-Action (Including Loss): $1,133,500

Assumes the following: a 50% chance of loss of 1.5 miles of Modoc NF ML2 road valued $50,000/mile; an 80% chance of loss of 1.5 miles of Shasta Trinity NF ML2 road valued at $50,000/mile; an 80% chance of loss of 5 miles of Klamath NF ML2 road valued at $50,000/mile; a 70% chance of loss of Klamath NF ML3 roads valued at $80,000/mile; 3 years of noxious weed treatments in 2023-2025 at a cost of $260,000 per year.

F. Cost of Selected Alternative (Including Loss): $521,750

Assumes the following: a 10% chance of loss of 1.5 miles of Modoc NF ML2 road valued $50,000/mile; a 20% chance of loss of 1.5 miles of Shasta Trinity NF ML2 road valued at $50,000/mile; an 20% chance of loss of 5 miles of Klamath NF ML2 road valued at $50,000/mile; a 15% chance of loss of Klamath NF ML3 roads valued at $80,000/mile; the cost of the $77,250 recommended road treatment package; 3 years of noxious weed treatments in 2022-2024 at a cost of $130,000 per year.

G. Skills Represented on Burned-Area Survey Team:

☒ Soils	☐ Hydrology	☒ Engineering	☒ GIS	☐ Archaeology
☒ Weeds	☐ Recreation	☐ Fisheries	☐ Wildlife	
☐ Other:				

Team Leader: Brendan Waterman
Email: brendan.waterman@usda.gov **Phone(s)** 385-377-4338

Klamath NF Forest BAER Coordinator: Bill Wall
Email: william.wall@usda.gov **Phone(s):** 530-643-3058

Modoc NF Forest BAER Coordinator: Chris Bielecki
Email: christopher.s.bielecki@usda.gov **Phone(s):** 530-801-1637

Shasta Trinity NF Forest BAER Coordinator: Brad Rust
Email: brad.rust@usda.gov **Phone(s):** 530-917-0434

Team Members: *Table 10: BAER Team Members by Skill*

Skill	Team Member Name
Team Lead(s)	Brendan Waterman
Soils	Eric Schroder, Mary Flores
Hydrology	unstaffed
Engineering	Kaci Spooner, Roxanne Reimer
GIS	Dan Reinkensmeyer
Archaeology	unstaffed
Weeds	Erin Lonergran
Recreation	unstaffed
Other	

H. Treatment Narrative: The following narratives summarize the response actions recommended to decrease risks to BAER Critical Values. Detailed specifications, cost estimates, and maps identifying the spatial location for the treatments are located in the Antelope BAER Assessment project record. The documents can be obtained by contacting the Klamath, Modoc, and Shasta-Trinity Forest BAER Coordinators. All treatment costs were estimated based on the assumption that off-forest Agency personnel or contract crews would be implementing the authorized treatments without the use of local unit NFSE salary funding. If personnel from the local unit are identified for implementation, current BAER salary and expense guidance regarding the use of H-code implementation funds would be adhered to. Project budgets represent the best estimate of the BAER assessment team and may be adjusted with interim funding authorization requests to reflect current market values at the time of contracting and implementation.

Land Treatments:

L1b. Early Detection Rapid Response (EDRR) Suppression: Early Detection Rapid Response (EDDR) surveys and treatments will be conducted in 2022 to mitigate the noxious weed emergency. Early detection and rapid response are key principles in preventing noxious weed infestations from becoming unmanageable and are the primary strategy prescribed during BAER assessments. This strategy improves the economic and environmental impacts by controlling infestations when they are small and unestablished. However, it is important to note that proposed treatments do not capture potential spread from unknown infestations on private land or for propagules brought in on contaminated equipment during initial phases of the fire. Treatments will be limited to suppression disturbed areas on NFS lands.

Shasta Trinity National Forest System Lands
Detection surveys are proposed along 17 miles of dozer line, at 4 drop points, at 2 staging areas, and at 1 safety zone. Treatment locations were identified because they are adjacent to known infestations or near sensitive plant communities. Rapid response treatments will consist of manual hand removal of any newly introduced infestations that are located during early detection surveys. Treatments will focus on broadleaf weeds; however invasive annual grasses will also be treated if feasible based on the extent of the newly discovered infestations. Treatment areas may be adjusted if deemed necessary based on field conditions

Table 11: EDRR Suppression Treatment Cost Shasta Trinity NF

Item	UOM	Unit Cost	# of Units	Total Cost
Three person GBI Crew	Day	$570	25	$14,250
GBI Crew Lead	Day	$250	25	$6,250
Materials (flagging, bags)	Lump Sum	$110	1	$110
Truck Rental/Fuel	Week	$600	5	$3,000
L1b EDRR Suppression Shasta Trinity NF Total Cost				**$23,610**

Modoc National Forest System Lands

Detection surveys are proposed along 23.4 miles of dozer line, at 5 drop points, and at 1 safety zone. Treatment locations were identified because they are adjacent to known infestations, near sensitive plant communities, or adjacent to high use recreation areas that have an increased potential for future spread. Rapid response treatments will utilize integrated management options including manual and chemical treatments. When used, herbicide will be applied in accordance with the Modoc National Forest Noxious Weed Treatment Project Environmental Impact Statement. Treatments will target both invasive broadleaf species and annual grasses. Proposed treatment areas may be adjusted if deemed necessary based on conditions encountered in the field.

Table 12: EDRR Suppression Treatment Cost Modoc NF

Item	UOM	Unit Cost	# of Units	Total Cost
Three person GBI Crew	Day	$570	30	$17,100
GBI Crew Lead	Day	$250	30	$7,500
Materials (herbicide, bags)	Lump Sum	$185	1	$185
Truck Rental/Fuel	Week	$600	6	$3,600
L1b EDRR Suppression Modoc NF Total Cost				**$28,385**

Klamath National Forest System Lands

Detection surveys are proposed along 59 miles of dozer line, at 7 drop points, and at 1 camp site. Treatment locations were identified because they are adjacent to known infestations, near sensitive plant habitat, meadows, riparian habitats, or areas that experienced moderate to high soil burn severity. Rapid response treatments will consist of manual hand removal of any newly introduced infestations that are located during early detection surveys. Treatments will focus on broadleaf weeds; however invasive annual grasses will be treated if feasible based on the extent of the newly discovered infestations. Proposed treatment areas may be adjusted if deemed necessary based on field conditions.

Table 13: EDRR Suppression Treatment Cost Klamath NF

Item	UOM	Unit Cost	# of Units	Total Cost
Three person GBI Crew	Day	$570	65	$37,050
GBI Crew Lead	Day	$250	65	$16,250
Materials (flagging, bags)	Lump Sum	$150	1	$150
Truck Rental/Fuel	Week	$600	13	$7,800
L1b EDRR Suppression Klamath NF Total Cost				**$61,250**

Channel Treatments: None recommended.

Roads and Trail Treatments: For additional discussions, alternative approaches, and referenced typical drawsets refer to the Burned Area Emergency Response Treatments Catalogue released by the USDA Forest Service, San Dimas Technology and Development Center, December 2006.

RT1a. Road Drainage (storm proofing existing drainage features – grading):
• Objective: Reopen existing flow paths for water to exit road.
• Description: Reestablish prism of road by grading out any berms or excess material blocking drainage ditches.

RT1b. Road Drainage (new drainage feature – rolling dip):
• Objective: Provide relief flow path for flooded roadway or overwhelmed culvert crossings to minimize diversion potential, associated erosion and subsequent damage of road prism.
• Description: Refer to *Fire Activity – Roads Typical Details* drawset, Sheet 8/16, Appendix D

RT2. Storm Inspection and Response:
• Objective: Monitor road drainage features, armoring and other treatments as they respond to significant storm events and subsequently repair damages that compromise the effectiveness of these efforts.
• Description: Inspection by qualified persons, determination of effectiveness, coordination of treatment restoration.

RT5. Culvert Armoring:
• Objective: Control erosion of the roadbed above the existing culvert when the culvert is overwhelmed with higher flow.
• Description: Armor inlet and outlet of existing culvert to provide erosion control.

RT7. Low-Water Crossing – armored ford:
• Objective: Protection of road from washout and erosion at stream or drainage crossing location or location where road may experience flooding.
• Description: Install armored ford at stream or drainage crossing locations or armor roadway in small sections where it is most likely to flood.

RT15. Other – Drivable Waterbars
• Objective: Provide relief flow path for overwhelmed cross drains or in-sloped roads with absent or inadequate cross drains to remove post-fire flows and sediment from the road prism, especially on steep road grades.
• Description: Refer to Fire Activity – Roads Typical Details drawset, Sheet 6/16, Appendix D

Table 14: Shasta Trinity NF Road Treatments

Shasta-Trinity NF				
Antelope Fire - Engineering Treatment Schedule				
Treatment	**Quantity**	**Unit**	**Cost**	**Total**
RT7. Low-Water Crossing - Armored Ford	2	Each	$ 2,500.00	$ 5,000.00
RT2. Storm Inspection and Response	3	Day	$ 750.00	$ 2,250.00
SHF Engineering Treatments Total				**$ 7,250.00**

Table 15: Modoc NF Road Treatments

Modoc NF				
Antelope Fire - Engineering Treatment Schedule				
Treatment	**Quantity**	**Unit**	**Cost**	**Total**
RT2. Storm Inspection and Response	3	Day	$ 750.00	$ 2,250.00
MDF Engineering Treatments Total				**$ 2,250.00**

Table 16: Klamath NF Road Treatments

Klamath NF				
Antelope Fire - Engineering Treatment Schedule				
Treatment	**Quantity**	**Unit**	**Cost**	**Total**
RT1b. Road Drainage	9	Each	$ 1,250.00	$ 11,250.00
RT15. Other – Drivable Waterbars	26	Each	$ 1,000.00	$ 26,000.00
RT5. Culvert Armoring	9	Each	$ 1,000.00	$ 9,000.00
RT7. Low-Water Crossing - Armored Ford	6	Each	$ 2,500.00	$ 15,000.00
RT1a. Road Drainage (storm proofing existing drainage features – grading)	2.0	Mile	$ 1,000.00	$ 2,000.00
RT2. Storm Inspection and Response	6.0	Day	$ 750.00	$ 4,500.00
KNF Engineering Treatments Total				**$ 67,750.00**

Protection/Safety Treatments:

P1a Burned Area Warning Signs: The purpose of the Burned Area Warning signs is to reduce risks to human life and safety and to inform forest visitors of potential dangers and/or hazards when entering burned areas on NFS lands. Entering burned areas presents a high risk to human and life and safety, with increased threats from post-fire effects such as falling trees, rolling rocks, flash floods, and debris flows. It is necessary to inform the public of burned-area hazards that are a direct result of wildfire; hazards which are substantially different compared to unburned forest setting and with which many forest visitors may be unfamiliar. Burned area warning signs will be installed to inform the public of the possible dangers associated with a burned area on major entry points into the burned area.

Table 17: P1a Road Warning Signs Shasta Trinity NF

P1a Warning Signs – Shasta Trinity NF	Units	Unit Cost	# of Units	Total Cost
P1a Road Warning Signs (materials and labor)	sign	$500	10	$5,000

Table 18: P1a Road Warning Signs Modoc NF

P1a Warning Signs – Modoc NF	Units	Unit Cost	# of Units	Total Cost
P1a Road Warning Signs (materials and labor)	sign	$500	2	$1,000

Table 19: P1a Road Warning Signs Klamath NF

P1a Warning Signs – Klamath NF	Units	Unit Cost	# of Units	Total Cost
P1a Road Warning Signs (materials and labor)	sign	$500	5	$2,500

I. Monitoring Narrative: Forest personnel will periodically review safety signs to ensure they are not being vandalized. Road drainage stabilization treatments will be monitored through implantation of the storm inspection and response plan. EDRR treatments will be monitored during follow up early detection surveys to ensure new weed infestation expansion is minimized.

PART VI a. – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS – Klamath NF

			NFS Lands				Other Lands				All
		Unit	# of		Other		Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
L1b EDRR Suppression	job	61,250	1	$61,250	$0		$0		$0	$61,250
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$61,250	$0		$0		$0	$61,250
B. Channel Treatments										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
RT1b. Road Drainage	Each	1,250	9	$11,250	$0		$0		$0	$11,250
RT15. Other – Drivable Wat	Each	1,000	26	$26,000	$0		$0		$0	$26,000
RT5. Culvert Armoring	Each	1,000	9	$9,000	$0		$0		$0	$9,000
RT7. Low-Water Crossing -	Each	2,500	6	$15,000	$0		$0		$0	$15,000
RT1a. Road Drainage (storr	Mile	1,000	2	$2,000	$0		$0		$0	$2,000
RT2. Storm Inspection and I	Day	750	6	$4,500	$0		$0		$0	$4,500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$67,750	$0		$0		$0	$67,750
D. Protection/Safety										
P1a Road Warning Signs	Each	500	5	$2,500	$0		$0		$0	$2,500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$2,500	$0		$0		$0	$2,500
E. BAER Evaluation										
Initial Assessment	Report	$30,900		---	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$0	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$131,500	$0		**$0**		**$0**	**$131,500**
Previously approved										
Total for this request				**$131,500**						

PART VII a. - APPROVALS

1. Kristina Goodman 10/22/2021

Klamath NF Forest Supervisor — Date

PART VI b. – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS - Modoc NF

			NFS Lands			Other Lands				All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
L1b EDRR Suppression	job	28,385	1	$28,385	$0		$0		$0	$28,385
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$28,385	$0		$0		$0	$28,385
B. Channel Treatments										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
RT2. Storm Inspection and I	Day	750	3	$2,250	$0		$0		$0	$2,250
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$2,250	$0		$0		$0	$2,250
D. Protection/Safety										
P1a Road Warning Signs	Each	500	2	$1,000	$0		$0		$0	$1,000
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$1,000	$0		$0		$0	$1,000
E. BAER Evaluation										
Initial Assessment	Report	$30,900		---	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$0	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$31,635	$0		**$0**		**$0**	**$31,635**
Previously approved										
Total for this request				**$31,635**						

PART VII b. - APPROVALS

CHRIS CHRISTOFFERSON

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Date: 2021.10.26 16:35:08 -07'00'

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Modoc NF Forest Supervisor Date

PART VI c. – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS-Shasta Trinity NF

			NFS Lands				Other Lands				All
		Unit	# of		Other		# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$		units	$	Units	$	$
A. Land Treatments											
L1b EDRR Suppression	job	23,610	1	$23,610	$0			$0		$0	$23,610
				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Land Treatments				$23,610	$0			$0		$0	$23,610
B. Channel Treatments											
				$0	$0			$0		$0	$0
				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Channel Treatments				$0	$0			$0		$0	$0
C. Road and Trails											
RT7. Low-Water Crossing -	Each	2,500	2	$5,000	$0			$0		$0	$5,000
RT2. Storm Inspection and I	Day	750	3	$2,250	$0			$0		$0	$2,250
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Road and Trails				$7,250	$0			$0		$0	$7,250
D. Protection/Safety											
P1a Road Warning Signs	Each	500	10	$5,000	$0			$0		$0	$5,000
				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Protection/Safety				$5,000	$0			$0		$0	$5,000
E. BAER Evaluation											
Initial Assessment	Report	$30,900		---	$0			$0		$0	$0
				$0	$0			$0		$0	$0
Insert new items above this line!				---	$0			$0		$0	$0
Subtotal Evaluation				$0	$0			$0		$0	$0
F. Monitoring											
				$0	$0			$0		$0	$0
				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Monitoring				$0	$0			$0		$0	$0
G. Totals				$35,860	$0			**$0**		**$0**	**$35,860**
Previously approved											
Total for this request				**$35,860**							

PART VII c. - APPROVALS

RACHEL BIRKEY

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Date: 2021.10.26 13:26:14 -07'00'

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Shasta Trinity NF Forest Supervisor Date