

Date of Report: Oct 3, 2019**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** – in red font (Best estimate of funds needed to complete eligible stabilization measures)
- 2. Interim Request #1
□ Updating the initial funding request based on more accurate site data or design analysis

PART II - BURNED-AREA DESCRIPTION**A. Fire Name:** Walker Fire**B. Fire Number:** CA-PNF-001324**C. State:** California**D. County:** Plumas**E. Region:** 05**F. Forest:** Plumas**G. District:** Mt Hough & Beckwourth**H. Fire Incident Job Code:** P5MQ4F**I. Date Fire Started:** Sept 4, 2019**J. Date Fire Contained:** Sept 26, 2019**K. Suppression Cost:** \$35,100,000 (Sept. 24, 2019)**L. Fire Suppression Damages Repaired with Suppression Funds (estimates as of Sept. 25, 2019):**

1. **Fireline repaired (miles):** Dozer-line, 75.6 miles, Hand-line, 17 miles
2. **Other (identify):** Drop points: 13, Safety zones: 2, Heli-bases: 2, Heli-spots: 2, Water sources sites: 8, and Communications repeater sites: 4

M. Watershed Numbers:*Table 1: Acres Burned by Watershed*

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
180201220304	Hungry Creek	12097	2777	23.0
180201220305	Cold Stream - Indian	14345	11248	78.4
180201220302	Antelope Creek	12994	2764	21.3
180201220206	Poison Cr - Last Chance	23802	18353	77.1
180201220203	Clarks Creek	11782	965	8.2
180201220202	Cottonwood Creek	10691	680	6.4
180201220204	Willow Cr - Last Chance	34361	3048	8.9
180201220205	Squaw Queen Cr	26850	4884	18.2
180201220103	Lower Red Clover Cr	37406	8557	22.9

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
180201220603	Ward Cr - Indian	19330	2307	11.9

N. Total Acres Burned (as of Sept. 23, 2019): 54,612

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	53655
OTHER FEDERAL (LIST AGENCY AND ACRES)	
STATE	
PRIVATE	957
TOTAL	54612

O. Vegetation Types: Sierra Mixed Conifer with White fir, Douglas fir and Ponderosa pine forest alliances in the west grading to Eastside Pine with Yellow pine alliances in the East. In the west, Chaparral is predominantly *Ceanothus* spp. (Tobaccobrush, Whitethorn, Deerbrush) and Manzanita (generally the dominant cover in areas previously burned by the Moonlight and Wheeler Fires), grading to Sagebrush/Bitterbrush amongst the Eastside Pine.

P. Dominant Soils: Cagwin-Toem, Holland-Wapi, Toem-Cagwin, and Chaix-Wapi Families Complexes (primarily Sandy Loams derived from Granodiorite). See table below for associated acres and percent occurrences in the burn area.

Soil Map Units	Acres	%
Cagwin-Toem families complex, 2 to 70 percent slopes.	12122	22
Holland-Wapi families complex, 30 to 70 percent slopes.	8235	15
Toem-Cagwin families complex, 2 to 55 percent slopes.	5934	11
Chaix-Wapi families complex, 50 to 70 percent slopes.	3729	7
Chaix-wapi families complex, 70 to 100 percent slopes.	3024	6

NOTE: The primary soil types are those associated with residuum from granitic parent material. Although different diagnostics separate the different series, on the ground the soils were either surface skeletal coarse soils or colluvial/alluvial coarse soils. Soils associated with volcanic parent material are scattered throughout the east side of the fire. These soils tend to have the highest erosion rates when burned due to the higher clay and silt content. Because the east side of the fire is drier with less ground fuels, the volcanic soils generally did not burn with moderate or high severity.

Q. Geologic Types: Primarily Mesozoic Granodiorite (part of the Sierra Nevada Batholith), with some Miocene Andesite to the south and east.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERRENIAL	43
INTERMITTENT	109
EPHEMERAL	397
OTHER (DEFINE)	0

S. Transportation System:**Trails:** National Forest (miles): 19**Roads:** National Forest (miles): 236**Other (miles):****Other (miles):** 30 (Plumas County) & 43 (non-system)**PART III - WATERSHED CONDITION****A. Burn Severity (acres):**

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	Acres	Percent (%)
Unburned/Very Low	8,062	14.7
Low	23,107	42.3
Moderate	14,737	27.0
High	8,736	16.0

B. Water-Repellent Soil (acres): Hydrophobicity was non-existent at the start of the assessment likely due to soil wetting due to a multiple day precipitation event. The last day of the assessment, as the soils dried with north winds, the hydrophobicity became strong and thick in all burn severities and was presumably prevalent throughout the fire area. Water repellency does not express itself as prominently when the soil is moist. Therefore, during extended winter wet periods, hydrophobicity will have less of an effect on runoff but will likely increase runoff rates and erosions during summer convective storms when the soils are dry. Bases upon these site-condition findings, it is estimated that 45% of the burn area (approximately 24,575 acres) would have some form water-repellent soils.

C. Soil Erosion Hazard Rating: 7,394 (moderate) / 42,306 (high) / 4,547 (very high)

D. Erosion Potential: See Table below.

Watershed	Acres	2 year event (tons/acre)	5 year event (tons/acre)	10 year event (tons/acre)
Indian Creek	71833	0.09	0.78	1.80
Indian Creek - Genesee Valley	279921	0.12	0.68	1.43
Last Chance Creek	130262	0.16	0.75	1.48
Middle Creek	12093	0.05	0.53	1.49
Red Clover Creek	78281	0.07	0.49	0.99
Fire		1.29	5.19	9.51

E. Sediment Potential: Because the delivery ratio of hillslope eroded material is unknown, the erosion rates are used instead of sediment delivery.

F. Estimated Vegetative Recovery Period (years): 3yrs (east-side) and 5yrs (west-side).

G. Estimated Hydrologic Response (brief description): A substantial increase in runoff and erosion is anticipated as a result of the Walker Fire. Peak flows of streams are estimated to experience roughly 2-10 fold increase in discharge volume. Post-fire hillslope erosion will be significant. 20-30% of the fire area has a high probability of generating debris flows from short-duration, high-intensity rain storms which have a recurrence interval of 1 to 2 years, and debris flows are also possible after longer duration rain events. Flash flooding is expected. Threats to life and safety and road infrastructure exist from flash flooding and debris flows as a result of the fire.

PART V - SUMMARY OF ANALYSIS**Introduction/Background**

The Walker Fire burned approximately 54,612 acres in northeastern California. The hottest parts of the fire occurred on steep, rocky side slopes and ridges. Approximately 53,655 acres of the burned area is on National

Forest System lands and the remaining 957 acres of burned area are privately owned properties. Elevations within the fire perimeter range from 3,683 feet in Genesee Valley to 7,015 feet near Babcock Peak. The fire primarily burned within the Indian Creek, Last Chance and Red Clover watersheds. The canyon walls are steep with an average of 30-65% on the mid-slopes. The majority of the runoff within the fire affected drainages flows in a south western direction, converging at the north eastern portion of Genesee Valley and join into Indian Creek.

The dominant soil types are those associated with residuum from granitic parent material. While different diagnostics separate the individual series, in-field observations presented soils that were either surface skeletal coarse soils or colluvial/alluvial coarse soils. Due to the orographic effect, the east side of the fire perimeter is drier with less ground fuels. As a result, the volcanic soils in the east did not predictably burn with moderate or high severity. However, the granitic-derived soils found in the west perimeter did experience moderate or high burn severities.



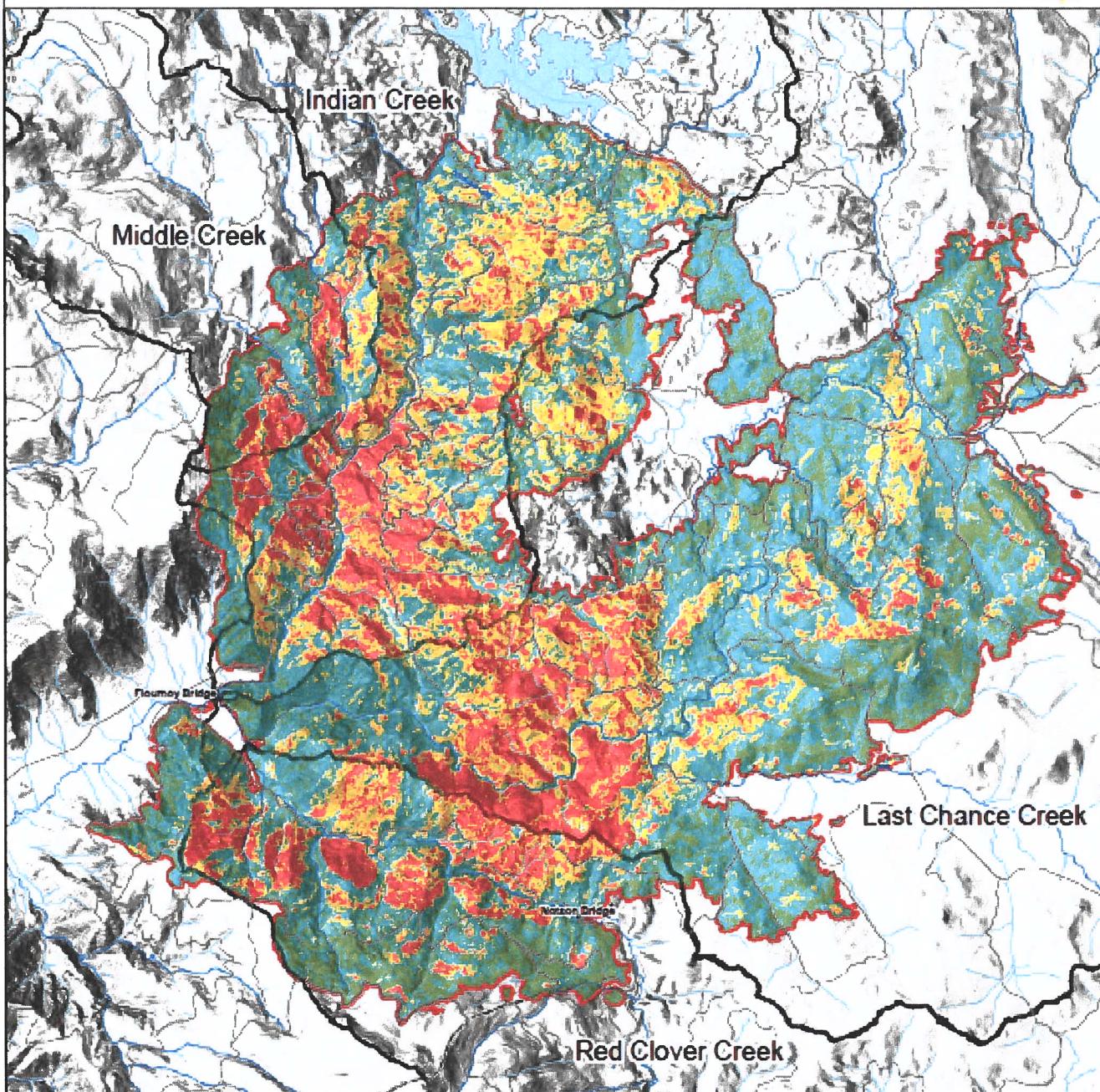
The initial Soil Burn Severity (SBS) map, estimated from a September 15 Burned Area Reflectance Classification (BARC) satellite image, was relatively accurate based on ground truthing field observations. High SBS corresponded very closely to dense conifer stands. For these areas, field investigations found on-the-ground SBS to correspond well with the BARC prediction and therefore the high SBS was not adjusted for the final SBS map. The default break between low and moderate SBS from the BARC imagery was adjusted for the final SBS to reflect a higher proportion of low SBS. This is because the BARC image mapped sage terraces and granitic boulder rubbleland on ridges and colluvial slopes as moderate SBS but field investigations found that little ground fuels existed on the sage terraces, resulting in lower SBS, and the rubbleland and colluvial slopes had little soil to burn. Strong and thick hydrophobicity was found in all levels of SBS and was estimated to occur in all moderate and high severity areas but only some of the low severity areas. Based upon findings in the field it is expected that during extended winter wet periods, hydrophobicity will have less of an effect on runoff but will likely increase runoff rates and erosions during summer convective storms when the soils are dry.

Final Soil Burn Severity

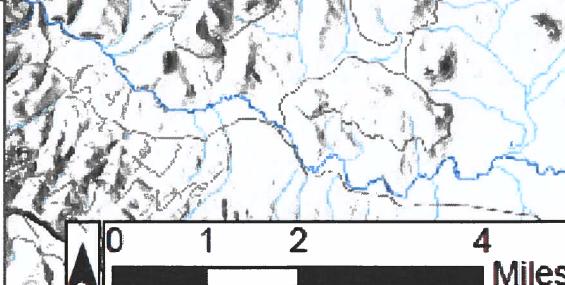
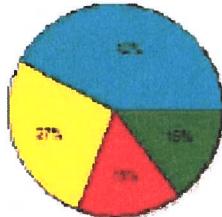
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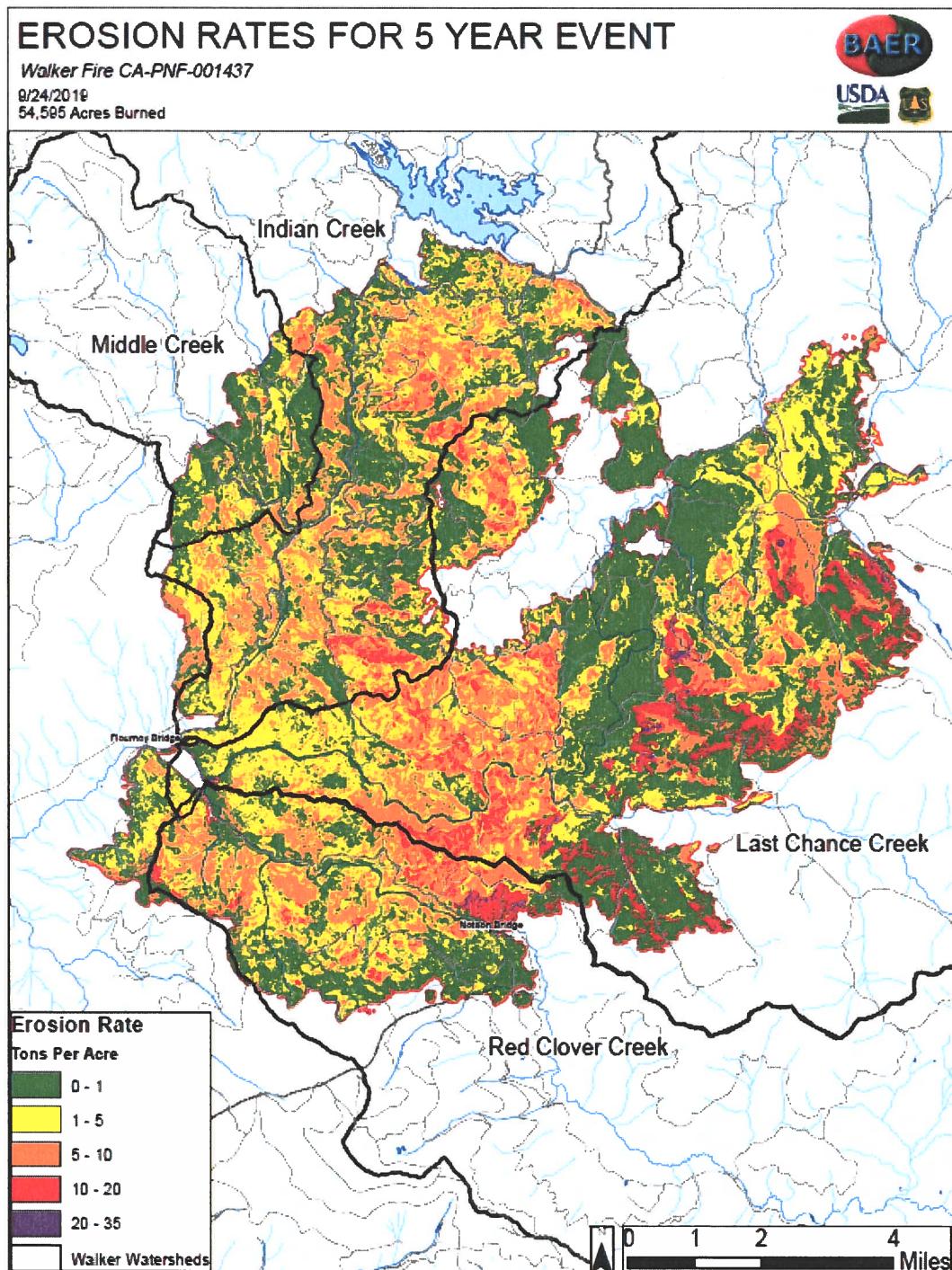
54,595 Acres Burned

**Soil Burn Severity**

High: 8,046 acres
Moderate: 14,737 acres
Low: 23,107 acres
Unburned/Very Low: 8,736 acres
Walker Watersheds

Percent Severity

The magnitude of erosion is highly dependent on soil texture. It's clear that the highest erosion rates occur in the southeast and east part of the fire because the volcanic parent material is finer textured and more prone to erosion. Fortunately the fire burned in a mosaic and the high erosion rates are isolated. In the west part of the fire along Indian Creek and the lower ends of Last Chance and Red Clover Creek, the soils are dominated by decomposed granite. These sandy soils produce less erosion per unit area, but due to the relatively broad extent of areas of high SBS, the amount of delivered sediment to the waterbodies will be higher. The erosion rates are highest in Last Chance Creek and Indian Creek. The erosion rates per watershed are not very high due to the large fraction of each watershed that did not burn. The localized rates will have notable channel effects on subwatersheds. Of particular concern is that wind scour has already removed much of the soil nutrient base in those granitic soils and water caused erosion will further reduce the soil productivity.



The primary watershed responses from the effects of the Walker Fire are expected to include: 1) initial flush of ash with normal precipitation; 2) gully and rill erosion on steep slopes in drainages with moderate and high soil burn severity with normal precipitation; and 3) increases in runoff, particularly runoff associated with rain. Elevated soil erosion, sedimentation, runoff, and stream flows are expected to decrease after the first year and return to the natural hydrological watershed function in five to seven years after the fire after vegetation has sufficiently recovered to restore the surface soil-hydrologic function and processes within the watersheds that burned at moderate and high severity.

Riparian vegetation associated with perennial streams did not completely burn in many streams within the Walker Fire and are expected to provide some buffer for some of the anticipated upland soil erosion. Also, much of the low to some moderate burn severity areas hold good potential for needle cast ground cover from burned trees, which will help to protect against soil erosion during the coming winter and spring.

Evidence of debris flows occurring before the fire within and around the Walker Fire burned area was observed by the BAER watershed specialists, indicating the potential for debris flows to occur post-fire, including debris fans with channel avulsion, scoured channels of upper watersheds of steep tributary ephemeral and intermittent streams, and relic boulder debris flow deposits along lower gradient sections of steep tributary ephemeral and intermittent streams. Small, steep tributary watersheds that experienced high and moderate soil burn severity have the highest potential to generate debris flows. USGS Debris Flow Model results determined that the rainfall intensity thresholds to initiate debris flows are as follows: 33.5 mm/h for a 15-minute storm (0.33 inches of rain in 15 minutes); 26.4 mm/h for a 30-minute storm (0.5 inches of rain in 30 minutes); and 23.8 mm/h for a 60-minute storm (0.9 inches of rain in 60 minutes). Debris flows with large quantities of boulders, cobble, sediment, and large wood material most often occur during exceptionally high precipitation and streamflow events. Rain on snow events are commonplace in the burned watersheds of the Walker Fire.

The north face of Turner Ridge that is just to the south of the Walker Fire is >7,000 feet elevation and often holds snow through late spring. The north face slopes of this ridge fall within the Walker Fire. Along Indian Creek is Wheeler Peak ridgeline on the east-side and Babcock Peak ridgeline on the west-side. Additionally, Last Chance Creek partially has Babcock Peak ridgeline on the north side and an unnamed ridge on the south that separated Last Chance Creek from Red Clover Creek. Elevations range from 3,800 > 7,000 feet.

Some extremely steep slopes in the upper watershed areas have little established vegetation and can act as the starting zone for narrow avalanche tracks. In time, these tracks are eventually dominated by alder thickets where soil, slope, and moisture conditions are conducive to supporting vegetation. Some historic mass wasting (debris flow) is evident within the fire perimeter, primarily in both Indian Creek and Red Clover Creek.

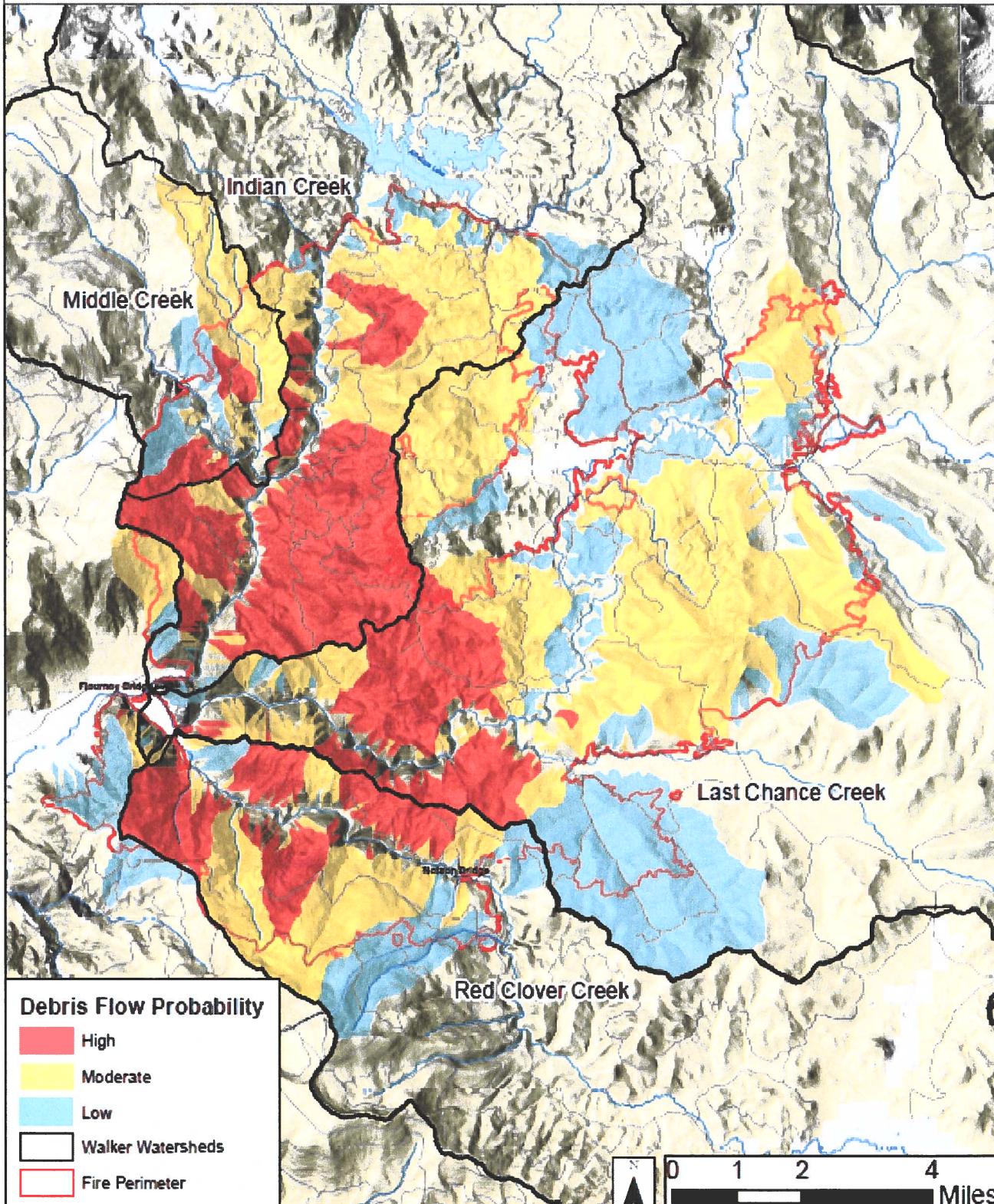
DEBRIS FLOW PROBABILITY

Peak 15-minute rainfall intensity of 32mm/hr, or 0.33 in./hr.

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54,595 Acres Burned



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

- There is a potential for rock fall and roadside hazard trees along many of the roads within and adjacent to the burn. The threat is to life and safety of road users, obstruction of roadway drainage courses, and denial of access until roads can be cleared. A particularly dangerous threat exists along Road 29N43 (Antelope Lake Road) from Genesee Valley at the Flournoy Bridge turnoff (near the fire ignition location) up the Indian Creek Canyon to Antelope Lake. The threat is to life and safety of road users. This is a popular road, used frequently by Forest recreationists. The road is located in decomposed granite soils and has steep, unstable cut slopes that are prone to erosion and rockfall even in moderate precipitation years. Clearing rocks from the road and clearing soils from the inside ditch to restore drainage function is typically the Plumas NF eastside road crew's first order of business each spring after snow clears from the road, in anticipation of frequent visitor traffic. Rocks that fall on the road can be several feet in diameter. Additionally, there are many roads within the Walker Fire that pose a high risk to travelers who use these roads due to rock fall, debris flow and flooding. Plumas County (PC) Road 111 runs parallel to Red Clover creek and is located at the bottom of that inner gorge. Areas above the 29N43 Road and the PC111 Road, along with many other NFS system roads, burned predominately with moderate to high severity. The potential for rock fall reaching these roads from the slopes above the inner gorge is very high, which poses a high risk to visitors and Forest Service employees and will require constant cleanup and maintenance.
- The occurrence of burned hazard trees, rock fall, and flash flooding was assessed at dispersed campgrounds along Indian Creek (Antelope Lake Road, NFS Road 29N43) and Red Clover Creek on PC111 within the Walker Fire. Hazard trees, rockfall, and flash flooding threats were identified that pose a substantial risk to people in and around these dispersed campgrounds. Additional dispersed campsites may exist throughout the burn area that may exhibit similar hazards as well.
- Burned trees that present an imminent hazard were observed along the Middle Creek Trail (approximately 2.5 miles) that runs through the burned area.
- There is a high risk to human life and safety should a large debris torrent cause massive flooding of homes located near the confluence of Indian Creek, Last Chance Creek and Red Clover Creek that is located on private within Genesee Valley. Stream deposition of material derived from such debris flows would occur at flatter channel locations such as the floodplain at the confluence of these channels within Genesee Valley, so flood waters could increase at a rapid rate that would not provide much time for homeowners to recognize and respond to the threat. Compounding this issue is the lack of ability for some of the private residents and emergency personnel to ingress and egress during emergency situation due to floodwaters and debris flows blocking access.

Property:

- The Forest Service developed roads, bridges, and trails are considered a government investment or asset and are needed for emergency, administrative and recreational access. Proposed road treatments are estimated at \$17,598 per mile. The value of the existing road system varies depending on road designs, maintenance and service levels, and is estimated at \$150,000 to \$500,000 per mile. In many areas of the fire, within and below areas of moderate and high burn severity, the ground cover was mostly consumed. Precipitation in these areas combined with the lack of vegetation and ground cover is expected to result in increased and flashy runoff; down slope movement of fine ash and sediment; rock fall, and possible debris flow until vegetation is reestablished. In the areas of light and moderate burn severity some brush remains with ground cover partially consumed. The increase in runoff in these locations will be far lower but transport of woody debris will increase significantly until vegetation is reestablished. Ditches, overside drains, natural drainage culverts and cross drains are at risk of losing their drainage function and diverting water onto the roadway or trail when becoming clogged with debris during post burn storm events. The proposed road and trail treatments if implemented as prescribed will reduce these risks.

Natural Resources:

- Values at risk within the Walker Fire include ecosystem health and integrity of native plant communities. Plumas National Forest lands support five threatened or endangered plant species, but none of these

species are known to occur within the Walker Fire area. The following R5 Sensitive Plants have known occurrences and suitable habitat within the fire: Mountain Lady's Slipper, (*Cypripedium montanum*), Plumas Ivesia (*Ivesia sericoleuca*), Lens-pod milkvetch, (*Astragalus lentiformis*), and Pulsifer's milkvetch, (*Astragalus pulsiferae* var. *pulsiferae*). Invasive weeds are very effective at occupying disturbed soil and displacing native plants and habitat, potentially degrading habitat for other plants and animals and lowering ecosystem stability. The introduction of propagules during fire suppression has the potential to establish new weed infestations. These new or expanded infestations would affect the structure and habitat function of native plant communities and ecosystems within the burn area and would require substantial sustained efforts to eradicate. Several noxious weed plants species are known to occur within the Walker Fire, including Yellow Starthistle (*Centaurea solstitialis*), Spotted Knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvense*), Scotch Broom (*Cytisus scoparius*), Dyer's woad (*Isatis tinctoria*), Perennial Pepperweed (*Lepidium latifolium*), and Medusahead Grass (*Elymus caput-medusae*). During fire suppression activities, 76 miles of dozer line, 14 miles of hand line, 35 miles of road as completed line, 13 drop points, 4 safety zones, 1 Heli-bases, 2 Heli-spots, 14 water source sites, 4 communications repeater sites, and numerous other "push-out" areas were created or improved. An additional fire camp was set up at Four Corners on the east side of the Walker Fire on the Beckwourth District. The ICP was subsequently transferred from Taylorsville to the Four Corners Camp. There is a high likelihood that yellow star thistle seeds were transported to the Four Corners area by the vehicles and equipment coming from Taylorsville. In addition to the new introductions and spread caused by the fire and fire suppression, many known weed infestations exist in the fire area and were burned. Several known infestations were visited to assess fire effects. Over 30 known sites of Canada thistle were burned in the interior of the fire along Indian Creek, Hungry Creek, and Clarks Creek. Several of these were observed to have been disturbed by dozers and it is possible that dozers created new infestation by spreading seeds. One site of Canada thistle that was disturbed by a dozer was observed to be re-sprouting prolifically before the fire was completely contained.

- There are no known occupied habitat or any designated critical habitat for T&E terrestrial or aquatic wildlife species within the Walker Fire.

Cultural Resources:

- None of the Cultural Resource sites visited and assessed on the Walker Fire burned area were found to be at "unacceptable risk". Soil movement would be low to none in the areas that the sites are located. Fire through the sites did not increase the threat of looting. Given the size of the burned area just a sampling of sites were assessed. No sites within the burn area are listed in the National Register of Historic Places (NRHP) or in State and local registers. There were some local Tribal concerns on the East Side, Beckwourth District. The District will handle the Tribal concerns.

Emergency Determination

The risk matrix below, Exhibit 2 of current national Forest Service Manual 2523 (Directive No. 2520-2017-1), was used to evaluate the Risk Level for each critical value identified during the BAER assessment. Resultant risk determinations of high and very high constitute an emergency to critical values due to the burned area. See the Walker Fire BAER Specialist Reports for additional discussion on values at risks and emergency determinations.

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):

- a. Hazard Trees and rock fall along NFS roads: The probability of rock and hazard trees falling along NFS roads and impacting Forest visitors or employees is likely along Road

- 29N43 (Antelope Lake), 27N09 (Hungry Creek), and many other NFS roads (Appendix D of the Walker Fire BAER Roads/Engineering Report) including Plumas County Road 111 (Red Clover Creek). The potential consequence of large rocks or trees to strike travelers in these areas is major. The risk of this threat is very high.**
- b. **Flooding and debris flow in residential communities downstream of the burned area:** The probability of substantial increased flooding and debris flow downstream of the burned area at residences near the burn area in Genesee Valley is likely to very likely due to the large proportions of high and moderate burn severity within the Indian Creek, Last Chance, and Red Clover Creek basins (See the Walker Fire Watershed Assessment Report). Consequences of such flooding could be major. Communication with other agencies is critical regarding changes in watershed conditions as a result of the fire in regard to the potential for flooding, increase in peak stream flows, sedimentation, flash flood hazard and debris flow hazard within and downstream of the burned area for public safety. Agencies that should be notified include those that address and manage the following: Emergency management within Plumas County, and water diversions and supplies, and management of Antelope Lake Dam (California Department of Water Resources). It is recommended that PNF staff be funded to coordinate with representatives of communities and other agencies to inform the public of the risks and hazards.
- c. **Hazard Trees along Forest Service trail:** The probability of hazard trees falling along the Middle Creek Trail is likely. The potential consequence if trees were to strike areas hikers or equestrians on the trail is major. The risk of this threat is very high.
- d. **Hazard Trees and rock fall at undeveloped campsites:** Hazard trees and rockfall were identified that pose a substantial risk to people in and around these dispersed campgrounds. Additional dispersed campsites may exist throughout the burn area that may exhibit similar hazards as well. The probability of rock and hazard trees falling are considered likely. The potential consequence if hazard trees and rocks fall and strike visitors in dispersed campsites is major. Additionally, flash flooding and debris flows are also possible in dispersed campsite that are situated along drainages and have a high likelihood to threaten visitors. The consequence of this threat is major and so the resultant risk is high.
2. **Property (P):Forest Service System roads:** The probability of increased streamflow, debris, and sediment causing loss of drainage function on NFS roads and causing significant erosion of the road infrastructure is likely to very likely. The magnitude of property damage is moderate to major. The risk of this threat is high to very high. The road with the greatest risk to sustain major damage caused by the fire is the 29N43 Antelope Lake Road. Seven of 11 miles of the road have a high to moderate burn severity directly above the road and it is very likely that the majority of the culverts and drainage structures along this 7-mile section will fail if not treated before this winter. See Walker Fire BAER Roads /Engineering Report for additional details.
- b. **Forest Service System trails:** The probability of increased streamflow, debris, and sediment causing loss of drainage function on NFS trails and causing significant erosion of the trail infrastructure is likely. The magnitude of property damage is moderate. The risk of this threat is high.
- c. **Plumas County Road:** Specific road issues related to Plumas County Road 111 (AKA Beckwourth-Genesee Road) should be addressed by agencies outside the USDA Forest Service include the following: The **Drum Bridge crossing** on Red Clover Creek along the Plumas County Road 111 – the Beckwourth-Genesee Road is anticipated to have woody debris, sediment and rock debris that could accumulate against Drum Bridge after significant rain storms. It is recommended that the bridge be inspected for debris piling against the bridge after significant rain storms.
3. **Natural Resources (NR):Invasive Noxious Weeds:** There is a very likely probability of spread and introduction of invasive noxious weeds into areas disturbed by fire. Damage to native plant communities would be considerable and long-term. The risk of this threat is very high.
- b. **Soil Productivity:** A High risk (Probability: Likely, Magnitude: Moderate) was determined for soil productivity. The soils are droughty when soil cover is removed and highly erosive.

During the fire, high winds removed several centimeters of nutrient rich soils and water erosion will likely remove more. The productivity of the soil is naturally low but downslope migration of soil during erosion is likely to reduce the thickness of soils, particularly at higher elevations and steeper slopes. Because the soils have low water-holding capacity, the removal of duff will likely reduce the natural recovery compared to more loamy soils. This reduction of soil productivity will last until shrub communities re-establish and subsequently increase duff and organic compounds within the soil. No treatment is proposed due to the extent of the risk, the steep slopes, and the inability to treat significant acreage in a timely manner. However a management recommendation is made in the Watershed Assessment Report.

- c. **Wildlife Habitat:** As mentioned previously, there are no known occupied habitat or any designated critical habitat for T&E wildlife species within the Walker Fire perimeter. Therefore no BAER funds are sought for wildlife habitat protection.
4. **Cultural and Heritage Resources:Cultural Resource Sites:** None of the Cultural Resource sites visited and assessed on the Walker Fire burned area were found to be at an “unacceptable risk”. There is unlikely probability and a minor consequence that increased runoff, erosion, flooding, or debris flow produced by the fire could cause low risk to Cultural Resource sites based upon field assessments. Therefore no BAER funds are sought for habitat protection.

B. Emergency Treatment Objectives: Per the national BAER Forest Service Manual risk matrix shown above, emergency situations are determined for a risk (combined probability and magnitude of consequence) of high or very high. Treatment strategies are prescribed to address these emergency situations. Treatment strategies for intermediate risks may be prescribed depending upon local circumstances. Treatment strategies are described below. Treatment objectives include protecting human life and safety by closing the 29N43 road with gates and by providing strategically-placed warning signs at this and other NFS roads for hazard tree and rock fall threats. Treatments to protect investments in NFS road and trail infrastructure are installing new or maintaining existing road and trail drainage facilities to control runoff and debris and prevent substantial erosion damage to the road and trail prisms. Native and naturalized plant communities are to be protected by inspecting disturbed areas for newly established noxious and invasive weed occurrences and treating these infestations by hand or, where permissible, chemically. Since funding would be available to implement the road and trail treatments this fall (2019), the probability of completing treatments prior to the first major damage-producing storm is predicted to be nearly 100%, with a small caveat for road treatments due to the usual uncertainties of finding available implementation staff and contractors. Noxious and invasive weed treatments is expected to occur as early as the spring of 2020.

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

Land n/a

Channel n/a

Roads/Trails 90 %

Protection/Safety 100%

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land (plant communities)	80	90	90
Channel	n/a	n/a	n/a
Roads/Trails	80	90	90
Protection/Safety	100%	100%	100%

E. Cost of No-Action (Including Loss): Several million \$ for potential injury or loss of life

F. Cost of Selected Alternative (Including Loss): \$788,375Skills Represented on Burned-Area Survey Team:

- | | | | | |
|---|---|---|-----------------------------------|---|
| <input checked="" type="checkbox"/> Soils | <input checked="" type="checkbox"/> Hydrology | <input checked="" type="checkbox"/> Engineering | <input 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: Antonio Dueñas
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Forest BAER Coordinator: Joe Hoffman
Email:joseph.hoffman@usda.gov **Phone(s):**530-283-7868

Team Members:Table 7: BAER Team Members by Skill

Skill	Team Member Name
<i>Team Lead(s)</i>	Antonio Dueñas
<i>Soils</i>	Eric Nicita
<i>Hydrology</i>	Becky Biglow (Dannon Dirgo trainee)
<i>Engineering</i>	Craig Kusener, Francisco Rico (Dan Hopkins, trainee)
<i>GIS</i>	None
<i>Archaeology</i>	Robert Grate (Miguel Jeffrey, trainee)
<i>Weeds</i>	Mike Friend
<i>Recreation</i>	None
<i>Other</i>	Seth Brown and Arthur Sprunger

H. Treatment Narrative:Land Treatments

Invasive Noxious Weeds: Early Detection Rapid Response (EDRR) surveys and treatments will be conducted in 2020 for Plumas NF target invasive plant species. Areas adjacent to existing infestations and areas disturbed during fire suppression (fire lines, fire camps, staging areas, transport routes, etc.) will be surveyed for new infestations and treated to prevent establishment. Existing infestations which had previously been controlled or near eradication will be treated in order to limit fire-induced expansion. Ideally, new infestations of noxious and invasive weeds will be detected while small enough to effectively eradicate and prevent the long-term establishment of new infestations. Infestations that are found would be hand treated if the infestation is small enough. Herbicide treatment will be used where appropriate. Treatment costs for estimated survey and treatment are presented below and are split between areas associated with fire suppression activities and existing weed areas not affected by suppression activities. Survey and treatment in subsequent years may be accomplished through a combination of Forest Service program funding and future supplemental BAER funding. Future supplemental BAER funding may be requested after the initial monitoring and assessment have been completed. See Walker Fire BAER Botany Report for more detail.

Personnel		Suppression-related	Non-suppression
GS -11 Botanist	\$450/day x 10 days =	\$2,250	\$2,250
GS – 7 Bio Tech	\$170/day x 80 days =	\$6,800	\$6,800
GS—5 Bio Tech	\$140/day x 60 days =	\$4,200	\$4,200
Supplies			
Telar (1 lb.)		\$200	\$200
Milestone (2.5 gal.)		\$500	\$500
Surfactant and dye		\$50	\$50
Transportation			
Mileage:	2,500 @ 0.50/mile =	\$625	\$625
	Subtotal:	\$14,625	\$14,625
	Total Cost Estimate for FY 2020:	\$29,250	

Channel Treatments: None
Roads Treatments: There are approximately 236 miles of National Forest System Roads (NFSR) and 30 miles of County roads within the Walker Fire perimeter. Forty-three miles of the (NFSR) roads are proposed to receive treatments. The maintenance level breakdown for system roads is shown in the table below.

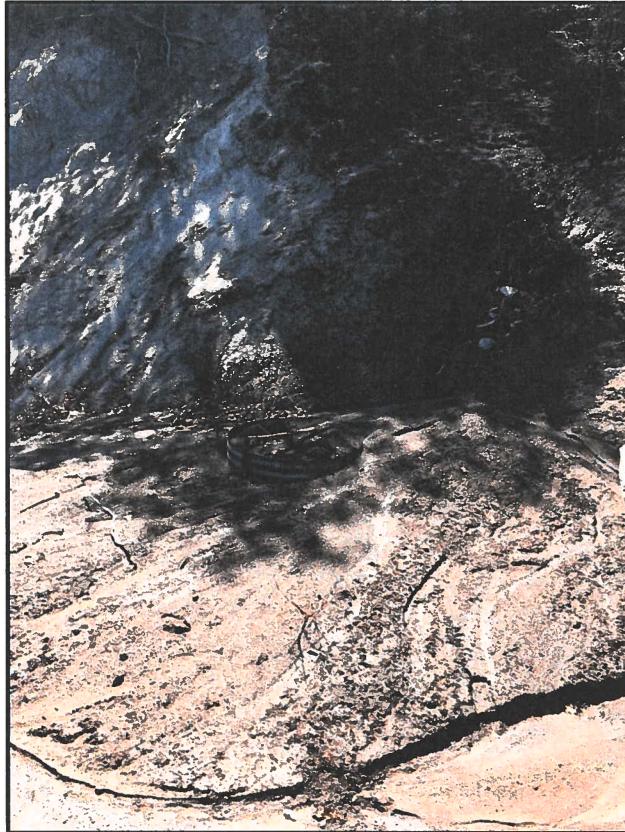
Maintenance Level	Approximate Length, Miles
5	23
3	29
2	172

The dominant roads on the landscape are maintenance level II roads (NFSR). The Roads group identified 4 locations along the Antelope Lake Road (29N43), and 2 stream crossings on other roads, where undersized 18" culverts should be replaced (upsized to 36") due to exceptional risk of losing the road due to a culvert failure in these heavily burned drainages. In addition, there are multiple locations along the 29N43 road that will receive traditional BAER drainage structure treatments, such as the installation of culvert inlet risers, metal end sections, and road drainage restoration. Proposed road treatments average \$14,800 per mile, which is high due to the cost needed to stormproof the multiple erosive drainages along 29N43. The Antelope Lake Road is a Level 5 road with dozens of crossings due to its mid-slope and bottom slope location along Indian Creek. Cost-effective crossing treatments such as armored overflow dips are not feasible on this chip seal paved road so additional cost is needed to improve the stream crossings. Rental of a vacuum truck is needed to clear debris and decomposed granite (DG) sediment that has already deposited inside the culverts during storms in September 2019 and ready them for increased flows this winter (see photo below of culvert inlet on 29N43 that has already plugged with DG). The average treatment cost per mile is nearly \$60,000 for treating the 7 miles of 29N43, and \$6,050 for the remaining 36 miles of road. The value of the existing road system varies depending on road designs and maintenance and service levels and is estimated at \$150,000 per mile to as much as \$500,000 per mile for the Antelope Lake Road. The cost for falling roadside hazard trees that is necessary to safely implement the road treatments is included in the item for restoration of road drainage function. Relief dips at crossings, installed to provide emergency overflow if the culvert plugs, would all be constructed on Level 2 roads and will be armored only at the outlets. Outlets of higher standard rolling dips necessary at road locations away from crossings will also be armored, with that cost included in the drainage armor item. Riprap for low water crossing structures is included in the unit cost. Headwall riprap is proposed for 10 crossings on 29N43 to prevent sloughing

of road embankment material that could plug the culverts. The proposed road treatments if implemented as prescribed will greatly reduce the risk of losing road segments over the coming winter and spring. See Walker Fire BAER Roads/Engineering Report, Appendix C for road treatment specifications.

Treatment	Unit	Quantity	Unit Cost	Total
Restore Drainage Function				
Restore Drainage Road	Mile	37.5	\$3,500.00	\$131,250.00
Install Roadway Dips				
Relief Dip at Culvert Crossings	Each	66	\$1,500.00	\$99,000.00
Rolling Dip (Energy Dissipation rock figured in drainage armor below)	Each	10	\$2,500.00	\$25,000.00
Low Water Crossing	Each	14	\$3,500.00	\$49,000.00
Maint. Culvert inlets & outlets				
Vaccum Truck Rental	Day	7	\$2,500.00	\$17,500.00
Install Culvert Inlet Treatments				
Mitered CMP Inlet/riser	Each	20	\$1,700.00	\$34,000.00
Rock Headwall (Riprap)	Each	10	\$1,200.00	\$12,000.00
Metal End Section 24"	Each	2	\$2,400.00	\$4,800.00
Metal End Section 36"	Each	10	\$3,600.00	\$36,000.00
Metal End Section 48"	Each	2	\$4,800.00	\$9,600.00
Install Drainage Armor				
	Cubic Yard	680	\$100.00	\$68,000.00
Repair and clean existing Overside Drains				
	Feet	100	\$50.00	\$5,000.00
Install and Remove Culverts				
	Each	6	\$14,000.00	\$84,000.00
Install Gates (includes purchase of gate)				
	Each	4	\$10,500.00	\$42,000.00
Install Signs				
BAER Warning and Info Signs	Each	22	\$800.00	\$17,600.00
Administrative Closure Signs	Each	6	\$500.00	\$3,000.00
Monitoring and Storm Patrol				
	Day	18	\$1,000.00	\$18,000.00
			Total	\$637,750.00

Trail Treatments: For trails within high and moderate soil burn severity areas, Forest Service employees will install adequate drainage relief to accommodate for expected increased runoff and monitor and mitigate worsening watershed conditions caused by insufficient drainage control structures.



Antelope Lake Road (29N43): Culvert inlet with riser is already plugged with decomposed granite sediment after rainstorms in September 2019. Rental of a vacuum truck is proposed to clean several culverts along the road and ready them for runoff this coming winter and spring.

Protection/Safety Treatments:

Road and Trail Hazard Signs: To protect Forest Visitors and USFS personnel, 4 metal gates (4-inch diameter steel) will be fabricated and installed at key intersections of Road 29N43 (Antelope Lake Road). These gates will be locked to prevent traffic on the road during times of risk, particularly during periods when precipitation is expected. Rock and hazard tree dangers warning signs would be installed to inform visitors of the risk. Estimated cost for each gate includes fabrication and installation of a 4" diameter steel locking gate. Estimated cost for each warning sign includes installation. Additionally, to alert visitors and USFS personnel of hazard tree dangers along roads and trails, install warning signs at strategic locations where the NFS roads enters the burned area and at the termini of heavily frequented NFS roads and trails within the burned area.

Public Awareness: Inform Plumas County and other emergency agencies and personnel of the moderate increase in potential for flooding due to debris flows in Indian Creek, Last Chance, and Red Clover Creeks, which could impact residents in the Genesee Valley. Where applicable, refer these property owners to USDA-NRCS for possible emergency protection programs.

I. Monitoring Narrative:

Land Treatments: Detect new infestations of noxious and invasive weeds while small enough to effectively eradicate and prevent the long-term establishment of new infestations.

Trail Treatments: Monitoring of all treated portions of non-motorized trails would be executed following the first runoff season to investigate the effectiveness of treatments. The integrity of the trail tread and evidence of off-site rill or gully erosion would be examined. Before / after photos would help to document the degree of effectiveness.

Road Treatments: Monitoring of a sample of treated roads would be executed following the first runoff season to investigate the effectiveness of treatments. The stability of the road prism and evidence of off-site rill or gully erosion or loss of road surface would be examined. Before / after photos would help to document effectiveness.

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

		NFS Lands			
Line Items	Unit	Average Unit Cost	# of Units	BAER Funds	
A. Lands Treatments					
Weed detection survey and treatment: Suppression-related	one season (2020)	\$14,625	1	\$14,625	
Weed detection survey and treatment: Non-Suppression	one season (2020)	\$14,625	1	\$14,625	
<i>Subtotal Land Treatments</i>				\$29,250	
B. Channel Treatments NONE					
<i>Subtotal Channel Treatments</i>				\$0	
C. Roads and Trails					
Road drainage maintenance and treatments	Total	\$599,150	1	\$599,150	
Trail stabilization treatments	Mile	\$1,200	12	\$14,400	
<i>Subtotal Roads and Trails</i>				\$613,550	
D. Protection and Safety					
Administrative closure signs	Each	\$500	6	\$3,000	
Road Closure Gates	Each	\$10,500	4	\$42,000	
Road hazard warning signs	Each	\$800	22	\$17,600	
Trail hazard warning signs	Each	\$800	2	\$1,600	
Interagency Coordination	Day	\$350	4	\$1,400	
<i>Subtotal Protection and Safety</i>				\$23,600	
E. BAER Assessment					
Assessment Team	Each	\$47,000	1	\$47,000	
<i>Subtotal Assessment</i>				\$47,000	
F. Monitoring					
Treatment effectiveness monitoring along non-motorized trails	Total	\$1,200	1	\$1,200	
Road treatment effectiveness monitoring	Day	\$1,000	18	\$18,000	
<i>Subtotal Monitoring</i>				\$19,200	
G. Totals					
Previously Approved				\$42,000	
Totals for this Request				\$685,600	

PART VII - APPROVALS

1. Emil Mogulies 4 Oct 2019
 for Forest Supervisor Date