Date of Report: 11/4/2021

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: McCash

B. Fire Number: CA-SRF-000651

C. State: CA

D. County: Siskiyou Co.

E. Region: R5

F. Forest: Klamath National Forest (KNF); and Six Rivers National Forest (SRF)

G. Districts: KNF - Happy Camp RD, Scott River RD, Oak Knoll RD, and Salmon River RD and SRF - Ukonom RD

H. Fire Incident Job Code: P2N7QM (0510)

I. Date Fire Started: 07/31/2021

J. Date Fire Contained: Est. 10/31/2021

K. Suppression Cost: $52M as of 10/22/2021

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

1. **Fireline repaired (miles):** KNF – 62.1 miles; SRF – 88.5 miles
2. **Other (identify):** KNF – 7 drop point, 9 helispots, 5 staging areas, and 1 stream crossing locations; SRF – 23 drop point, 2 helispots, 4 staging areas, and 1 stream crossing locations.

M. Watershed Numbers:

Table 1: Acres Burned by HUC 12 Watershed

HUC 12 #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
180102100303	Hancock Creek	10,508	1,007	9.6
180102090602	Independence Creek	11,508	11,492	99.9
180102090303	Lower Elk Creek	29,995	13,835	46.1
180102100305	Lower Wooley Creek	21,149	1,039	4.9
180102100304	Middle Wooley Creek	23,523	13,699	58.2
180102100301	North Fork Wooley Creek	14,076	6,263	44.5

HUC 12 #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
180102090702	Ti Creek-Klamath River	13,623	6,578	48.3
180102090604	Titus Creek-Klamath River	19,360	5,405	27.9
180102090603	Ukonom Creek	20,932	18,656	89.1
180102090301	Upper Elk Creek	20,506	8,927	43.5
180102100302	Upper Wooley Creek	25,861	6,107	23.6

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS - KNF	53,636
NFS - SRF	41,051
OTHER	201
TOTAL	**94,888**

O. Vegetation Types: The McCash fire burned through rugged and steep terrain on the Happy Camp and Ukonom districts of the Klamath National Forest. Impacted vegetative communities occurred between 459 and 8,287 feet in elevation. Dominant vegetative communities were characterized as mixed conifer hardwood forests. Common overstory species include Douglas fir (*Pseudostuga menziesii* (Mirb.), incense cedar (*Calocedrus decurrens* (Torr.) Florin), madrone (*Arbutus menziesii* Pursh), black oak (*Quercus kelloggii* Newb.), Oregon white oak (*Quercus garryana* Hook.) and canyon live oak (*Quercus chrysolepis* Liebm.). Common understory species include tanoak (*Notholithocarpus densiflorus* (Hook. & Arn.) Manos, C.H. Cannon, & S. Oh), chinquapin (*Chrysolepis chrysophylla* (Hook.) Hjelmq.), deer brush (*Ceanothus integerrimus* Hook. & Arn.), snowbrush (*Ceanothus velutinus* Douglas), sword fern (*Polystichum munitum* (Kaulf.) C. Presl), and Oregon grape (*Berberis nervosa* Pursh). True fir forests of white fir (*Abies concolor* (Gordon & Glend.), and Shasta red fir (Abies magnifica var. shastense) with mountain hemlock (Tsuga heterophylla) and minimal understory components are found at the upper elevations' areas. Riparian areas generally consisted of white alder (*Alnus rhombifolia* Nutt.), big leaf maple (*Acer macrophyllum* Pursh), elks clover (*Aralia californica* S. Watson), and umbrella plant (*Darmera peltata* (Torr. ex Benth.) Voss).

P. Dominant Soils

Table 3: Dominant Soil Families in the McCash Fire

Soil Name	Acres	Slope (%)	Texture
Clallam-Deadwood families association	18,860	50-90	Very gravelly loam
Gilligan-Goldridge families association	15,826	30-90	Sandy loam
Deadwood-Clallam families association	13,329	50-90	Extremely gravelly loam
Gilligan-Chawankee families association	9,042	30-90	Sandy loam
Gerle family	8,970	50-90	Gravelly sandy loam

The Clallam soils are used primiarly for timber production. Natural vegetation includes Douglas-fir, western hemlock, grand fir, western redcedar, red alder, and Pacific madrone. The Clallam series consists of moderately deep to densic materials, moderately well drained soils formed in glacial till overy very compact glacial till. Clallam soils are on glaciated hills. Slopes range from 0 to 90 percent. The Deadwood soils are shallow, somewhat extensively drained soils formed in material weathered from hard metasedimentary rocks. Vegetation is typically open mixed stands of ponderosa pine and sugar pine along with Douglas-fir, incense-cedar, and canyon oak. Gilligan soils are on stream terraces and used primarily as woodland. This series consists of very deep, well drained soils formed in alluvium and glacial outwash on terraces. The Goldridge series consists of deep and very deep, moderately well drained soils formed in material weatehred from weakly consolidated sandstone. Found on rolling uplands with slopes of 2 to 50 percent. The Goldridge soils are used primarily for timber production with native vegetation consisting of redwood, Douglas-fir, madrone and tanoak. The Chawanakee series consists of shallow, somewhat excessively drained soils formed in material weathered from quartz diorite and granodiorite low in mafic minerals.

Chawanakee soils are on mountains and hills and have slopes of 2 to 110 percent. The Chawanakee soils are used primarily for timber production with native vegetation consisting of ponderosa pine, incense cedar, California black oak and canyon live oak. The Gerle soils are used primarily for timber production. Natural vegetation includes red fir, white fir, Jeffrey pine, lodgepole pine, sugar pine, incense-cedar, chinquapin, and huckleberry.

Q. Geologic Types: The McCash Fire lies within the Klamath Mountain physiographic province. The fire area is within the Western Paleozoic and Triassic Belt and is predominantly underlain with Jurassic aged quartz diorite, diorite, granodiorite, tonalite, and gabbro of the Wooley Creek Batholith. The south-eastern portion of the fire area is underlain by Permian to Jurassic metamorphosed sedimentary rock predominately argillite with secondary conglomerate, breccia, and cherts of the Eastern Hayfork unit of the Sawyers Bar Terrane. The north-western portion of the fire area is composed of argillite, metamorphosed volcanic sediments of the Western Hayfork terrane, peridotite, serpentinite, lenses of limestone of the Eastern Hayfork unit within the Sawyers Bar Terrane, and Mesozoic intrusive diorite plutons. The north-east portion of the fire area is composed of Permian to Jurassic gabbro, peridotite, and metasediments of the Rattlesnake Creek Terrane.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
INTERMITTENT	268
PERENNIAL	223
ARTIFICIAL PATH	7
TOTAL	498

S. Transportation System:

Trails: *National Forest (miles):* KNF – 41.8; SRF – 36.5 *Other (miles):*
Roads: *National Forest (miles):* see table below *Other: Non USFS Roads (miles):* 0

Table 4: Roads: National Forest (miles)

	KNF	*SRF**
Level 0- Not Maintained roads	---	23.66
Level 1 - Administrative Use	15.94	22.82
Level 2 - High Clearance Vehicle	49.13	21.86
Level 3-5 - Passenger Vehicles	10.02	9.06
TOTAL	**75.09**	**77.40**

PART III - WATERSHED CONDITION

A. Burn Severity (acres): McCash_SBS_Public20211022.jpg | Powered by Box

Table 5: Burn Severity Acres by Ownership

Soil Burn Severity	NFS – KNF	NFS - SRF	OTHER
Unburned	16,605	15,497	105
Low	17,957	14,976	77
Moderate	16,585	8,624	18
High	2,489	1,954	1
Total	53,636	41,051	201

B. Water-Repellent Soil (acres): 18,632 (19.6%)

Water repellency is a natural property that results from wax-like exudates from biological process that coat soil particles. Although it is a natural property heat from the fire vaporizes some of the compounds and they

condense lower in the soil when it contacts cooler soil. This tends to make the water repellency stronger, or more severe. Estimated as a function of inherent repellency that varies by soil texture as influenced by SBS. Approximately 19.6% (18,632 acres) of the soils within the McCash fire have hydrophobicity traits or have had an increase in these traits.

A. Soil Erosion Hazard Rating:

Table 6: Soil Erosion Hazard Rating

EROSION HAZARD	ACRES	(%)
Very High	48,274	50.9
High	42,976	45.3
Moderate	3,529	43.7
Low	109	0.1
Total	94,888	100.0

B. Erosion Potential: 14.6 - 25.0 tons/acre/year; average = 19.8 tons/acre/year

We looked specifically at modeled response to a 5- and 10-year storm event which have a 30 and 10 percent likelihood of occurrence, respectively, within the first two years post-fire. Average sediment delivery in the instance of 5-year storm event is predicted to be 14.6 tons/acre/year for the entire fire area for the first two years post-fire. This is an increase from pre-fire sediment yield predictions of 5.0 tons/acre/year for a 5-year runoff event. In the instance of a 10-year storm event within the first two years of post-fire recovery the average sediment delivery rate predicted for the fire area is 25 tons/acre/year. This is an increase from 12.3 tons/acre/year in pre-fire conditions for a 10-year runoff event.

After completing post-storm assessments after the first damaging storm, we have identified that the emergency conditions still exist in areas at risk either in the fire perimeter or downstream outside the fire perimeter in terms of accelerated soil erosion.

C. Sediment Potential:

2,955 – 6,770 cubic yards/square mile/year; average = 5,363 cubic yards/square mile/year

It is assumed that 35 percent of sediment would be delivered based on slope roughness, surface rock fragments, and downed large woody debris near streams that would function as sediment delivery interrupters. ERMiT estimates for erosion potential in tons per acre were converted to cubic yards per square mile.

Table 7: Modeled pre- and post-fire erosion potential at select pour points for the 5-yr and 10-yr peak flows using ERMiT

Watershed Name	Total Acres*	Acres Burned	Extent Burned (%)	5-Yr. Storm Event Avg. Sediment Delivery				10-Yr. Storm Event Avg. Sediment Delivery			
				Pre-Fire		Post-Fire		Pre-Fire		Post-Fire	
				Tons /acre	yds^3/ mi^2	Tons/ acre	yds^3/ mi^2	Tons /acre	yds^3/m i^2	Ton s/acr e	yds^3/mi^2
East Fork Elk Creek	10,328	17	0.2	5.7	4,414	19.3	14,946	13.0	10,067	30.7	23,774
Lower Elk Crk.	29,995	13,835	46.1	5.2	4,027	17.4	13,475	12.9	9,990	28.3	21,916
Upper Elk Crk.	20,506	8,927	43.5	5.3	4,104	17.4	13,475	13.8	10,688	27.7	21,451
Grider Crk.	27,562	255	0.9	3.8	2,943	11.1	8,599	8.9	6,892	17.9	13,862
Hancock Crk.	10,508	1,007	9.6	5.2	4,027	18.6	14,404	12.3	9,525	32.6	25,245
Independence Crk.	11,508	11,492	100.0	5.8	4,492	19.0	14,714	13.9	10,764	31.1	24,084
Lower Wooley Crk.	21,149	1,039	4.9	4.1	3,175	12.7	9,835	10.4	8,054	19.7	15,256
Middle Wooley Crk.	23,523	13,699	58.2	5.0	3,872	16.2	12,545	12.6	9,757	25.9	20,057
N. Fork Wooley Crk.	14,076	6,263	44.5	5.6	4,337	18.2	14,094	13.8	10,68	29.5	22,845
Upper Wooley Crk.	25,861	6,107	23.6	5.8	4,492	20.5	15,875	13.1	10,145	35.0	27,104

Reynolds Creek – Klamath River	34,611	1,587	4.6	5.3	4,104	17.8	13,784	13.5	10,454	29.0	22,458
Swillup Creek – Klamath River	15,156	20	0.1	6.3	4,879	23.6	18,276	17.3	13,397	42.9	33,222
Ti Creek – Klamath River	13,623	6,578	48.3	5.5	4,259	18.1	14,017	13.6	10,532	28.8	22,303
Titus Creek – Klamath River	19,360	5,405	27.9	5.5	4,259	18.0	13,939	12.8	9,912	30.1	23,309
Ukonom Creek	20,932	18,656	89.1	5.6	4,337	18.8	14,559	13.5	10,454	30.1	23,309

Comparison of pre- and post-fire sedimentation rates from modeled 5- and 10-year storm events for HUC 12 watersheds within the fire perimeter. Interpreted acres for those that were adjusted from the original BARC image that was taken October 4th, 2021. *Acres are estimates based on the size of the fire at the time of analysis. Acreage estimates may vary slightly due to rounding error and method of geospatial analysis.

D. Estimated Vegetative Recovery Period (years):

3-5 years depending on elevation. Lower elevations sites would likely have a quicker recovery period compared to higher elevations sites. Based on the final soil burn severity (SBS) map, it appears that sufficient seed sources remain throughout much of the burn area to assist with a rapid natural recovery.

E. Estimated Hydrologic Response (brief description): McCash Pourpoint Map.png | Powered by Box

The post-fire hydrologic response for the eleven HUC 12 watersheds located entirely or partly within the fire perimeter was modelled using regional flow regression equations developed by the U.S. Geological Survey that were adjusted with bulking factors to account for increased flows laden with debris and sediment. The HUC 12 runoff estimates were supplemented with additional runoff estimates for smaller catchments using the Wildcat5 rainfall-runoff hydrograph method. The team selected a 5-year, 6-hour rainstorm as the design storm for the Wildcat5 method. The amount of rain occurring in a 6-hour period fits with potential fall rains, and it is these storms that are most likely to impact values within and downstream of the burned areas. Rainfall amounts were selected for individual pour point locations and ranged between 2.3 and 2.7 inches in the 6-hour period.

Modelled increases in runoff from the affected HUC 12 watersheds ranged between almost none to two times that of pre-fire conditions. The largest projected increase in flow was in the Independence Creek Watershed which predicts a 2.1-fold increase in runoff. Projected increases dropped off slightly for the next five HUC 12 watersheds. Runoff in Ukonom Creek was projected to increase by 1.6 times pre-fire conditions. The Lower and Upper Elk Creek, Middle Wooley, and North Fork Wooley Creek watersheds all showed predicted increases of 1.4 times that of pre-fire conditions. The increased hydrologic response in all watersheds is proportional to the total acres burned at moderate, and to a lesser extent, high SBS. Only 5% of the total acreage within the McCash Fire footprint burned at a high SBS, but 27% burned at a moderate SBS which increased estimated post-fire runoff.

The Ti Creek-Klamath River HUC 12 drainage displayed a predicted increase of 1.3 which is lower than the aforementioned drainages. This lower value was partly due to portions of this HUC 12 being outside of the fire perimeter. In order to better predict effects to Ti Creek the Wildcat5 model was used to model three pour points in this drainage. Predicted increases in runoff were 1.4, 1.7 and 1.7 for these three pour points, respectively.

The modelled flow increases for some HUC 12 watersheds and pour points suggest that substantial increases in flow will only occur in the drainages already noted above, but the BAER assessment results also suggests that the risk of damaging storms remains in the McCash Fire area and that recommended treatments are still warranted. Road systems in both the Independence Creek and Ti Bar Creek drainage located upslope of critical habitat for T&E species have been damaged by the fire. Pipes at stream crossings have been damaged and could fail during fall and winter rains detrimentally impacting water quality, T&E species habitat and resulting in the loss of the roads themselves. Flow modelling already shows a 2-fold increase in flow in Independence Creek in response to the 5-year, 6-hour storm which strongly suggests that a high risk remains for critical values in this watershed. While modelled flows in Ti Creek are lower than Independence Creek, between 1.3 and 1.7-times pre-fire flows, it is worth noting that the Ti Creek drainage is located in the 21 percent of the McCash Fire that has not burned previously. A review of past storm response to earlier fires

occurring in the McCash Fire area and observations following the October 2021 rainfall events suggests that the areas that burned for the first time in the McCash Fire are more likely to exhibit a watershed response to larger storms because they have not previously eroded in past fires, which in turn increases the risk of failure of roads and trails and the risk of loss of critical values.

Based on the information above and in resource reports detailing the assessment results, an emergency condition still exists. Damaging storms can still occur and result in a loss of critical values due to increased peak flows and sediment delivery to riparian and aquatic systems.

F. Estimated Geologic Response (brief description):

During this BAER analysis, a moderate storm cycle brought a relatively high short-term precipitation rates to the area impacting the fire area. A nearby CA State rain gauge recorded a total of 0.24 inches of rain within 15 minutes. That 15-minute interval was close to our more conservative trigger/threshold for the fire area of 0.25 inches in 15 minutes; however, some localized debris flows were initiated and deposited sediment and debris to channels as did smaller scale erosion that increased sediment in channels across the fire area. Although this storm event could be considered large enough to qualify as the fire area's first damaging storm, it must be noted that of the erosion that occurred more material remains in the system to be mobilized by future events of similar and even smaller magnitudes.

The USGS debris flow model has highlighted the following watersheds in order within the McCash Fire as having the highest possibility of debris flow initiation; Independence Creek, Upper Wooley Creek, Elk Creek, Ukonom Creek, and Ti Creek. The recent storm resulted in sediment production in the Independence and Elk Creek watersheds evidenced by higher turbidity, but no new sediment deposition was observed. Some channel incision withing these watersheds were observed, but relatively minor when compared to other fire scars in the region.

McCash_DebrisFlowProbability.jpg | Powered by Box and
McCash_DebrisFlowCombinedHazard.jpg | Powered by Box

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The McCash Fire was lightening caused and first observed on July 31, 2021. The fire was burning in timber with an understory of tall grass and brush in rugged, steep terrain in an area with limited roads and partially within the Marble Mountain Wilderness on the Orleans Ranger District of the Six Rivers National Forest. The McCash Fire's growth progressed slowly due to heavy smoke from other fires in the area as well as its own. After two weeks, it had only grown to 2,599 acres. It grew incrementally expanding onto the adjacent Klamath National Forest until a large wind event on August 31, 2021. This wind event along with subsequent wind events expanded the Fire to its current acreage of 94,888 acres.

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

A comprehensive list of potential values at risk within or directly downstream of the River Complex burned area was compiled through consultation with local management and resource specialists and through BAER Team on the ground and GIS assessments. It can be requested from the Project Record or can be found here: Critical_Value_Table_McCash_BAER_2021_R5_KNF_SRF.xlsm | Powered by Box . Following guidance in Interim Directive 2520-2013-1, the BAER assessment team evaluated this list of values through field assessment and subsequent analysis to identify the BAER critical values (FSM 2523.1 – Exhibit 01) that may be treated under the BAER program. The BAER critical values were then assigned a level of risk defined by the probability of damage or loss coupled with the magnitude of consequences using the risk assessment matrix (FSM 2523.1 – Exhibit 02). The BAER critical values with unacceptable risks signify a burned-area emergency exists. The characterization of the probability of damage or loss is based on the watershed response analysis completed by the BAER Assessment. BAER Critical values having a "Very High" or "High"

risk rating include recommended emergency stabilization actions known to mitigate potential threats or minimize expected damage, which are described below.

After nearly a year without rain, a series of potent storms (referenced as an atmospheric river) impacted Northern California during the BAER Assessment. There is no rain gauge data for the McCash Fire. The 10-day storm total for this event utilizing nearby gauges ranged from 7.5 to 9.5 inches of rain. The Team conducted a secondary rapid assessment and found several threats still existed.

No treatments were identified for NFS values when the analysis resulted in an "Intermediate" or lower risk rating for all categories except for human life/safety. Non-National Forest System (NFS) values and threats were identified but not assessed for risk. Where a threat was identified, the BAER team recommends that these values are referred to local, state, and other federal cooperators for their own risk assessment.

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. **High** risk to human life/safety on NFS land from threats associated with hazard trees, burnt out stump holes in the prism of the road and trail, rock fall, increased flooding and debris flows, and loss of egress/access throughout the burned area, but particularly on roads (KNF and SRF) and trails including the Pacific Crest and Kelsey National Scenic Trails (KNF only) in high to moderate SBS in and downstream of the burn. Within and downstream of the burned area, locations of particular concern include: Elk Creek and Independence Creek drainages (KNF) and Ukonom and Ti Bar Creek drainages (SRF). These drainages are expected to see higher runoff and debris flows post-fire with a high probability of entrapment. Treatment recommendations are site specific administrative closures, install warning signage for both roads and trails, and storm patrol inspections and response to ensure treatments are functioning as intended. (KNF and SRF)
   b. **High** risk to human life and safety of Forest visitors and employees accessing operational maintenance level (OPML) 1 and decommissioned roads; now devoid of vegetation. Forest visitors and employees may be at risk due to inadvertently travelling on unmonitored templates. Treatment recommendations include referring this to the BAR program and installing temporary closures and warning signage. (KNF and SRF)
   c. **High** risk to human life/safety of Forest visitors and users on NFS land from threats at recreation sites associated with post-fire impacts, including flooding, rolling rocks, hazard trees, burnt out stump holes, and debris flows in areas with high to moderate SBS. There are ten trailheads and five campgrounds on the KNF and one trailhead on the SRF within or directly adjacent to the burned are. See BAER VAR Table/Recreation Specialist Report for a comprehensive list of these sites. Treatment recommendations include temporary site-specific closures and install warning signage. These areas will need to be assessed for hazard trees prior to reopening and as part of long-term recovery efforts. (KNF and SRF)
   d. **High** risk to human life/safety on NFS land from threats associated with hazard trees, rock fall, increased flooding and debris flows throughout the burned area, but particularly travelling cross country on foot or by horseback in high to moderate SBS. Treatment recommendations include install warning signage at major access points before entering the burn and along roads and trails. (KNF and SRF).
   e. **High** risk to human life/safety of Forest visitors and users on NFS land from threats at dispersed camping areas associated with post-fire impacts, including flooding, rolling rocks, hazard trees, burnt out stump holes, and debris flows in high to moderate SBS in and downstream of the burn

area. Treatment recommendations include install warning signage at major access points before entering the burn and along roads and trails. (KNF and SRF).

f. **Intermediate to Low** risk to human life/safety on NFS land from threats associated with hazard trees, burnt out stump holes in the prism of the road, rock fall, increased flooding and debris flows, and loss of egress/access throughout the burned area, but particularly on roads (KNF and SRF) and trails (KNF and SRF) in low SBS in and downstream of the burn. Treatment recommendations include referring this to the BAR program and or Post Storm Assessment needs. These areas will need to be assessed for hazard trees as part of long-term recovery efforts. (KNF and SRF)

g. **Low to Very Low** risk to human life/safety of Forest visitors and users on NFS land from threats at developed recreation sites associated with post-fire impacts, including flooding, rolling rocks, hazard trees, burnt out stump holes, and debris flows in areas with low SBS. See BAER VAR Table/Recreation Specialist Report for a comprehensive list of these sites. Treatment recommended is natural recovery. These areas will need to be assessed for hazard trees as part of long-term recovery efforts. (KNF and SF)

There may be an increased threat to private residences, to several local, county and state roads, and to municipal water systems within and adjacent to the fire perimeter. Water quality for domestic water sources may be at an increased risk from increased sedimentation. Several private residences and local, county and state roads exist downstream from the fire area. Coordination and information sharing with landowners, Karuk Tribe, NRCS, CalTrans, NWS, USGS, and other emergency services is recommended. (KNF and SRF)

2. **Property (P):**a. **Very High** risk to 22.58 miles on the KNF and 10.12 miles on the SRF of NFS road prisms (OP ML 2-5) and associated NFS road infrastructure (bridges, culverts, etc.) in high to moderate SBS with substantial damage expected because of imminent flooding, debris flows, and erosion. Post fire conditions and predicted watershed response indicate increased runoff, excessive sedimentation, debris flows, and rockfall will impact roadway drainage features, such as roadside ditches, culvert inlets, over side drains, roadway dips and run outs. Once these drainage features become impacted and overwhelmed, their function fails, allowing uncontrolled water to divert, resulting in major damage to the road and invested road improvements, loss of road function, and the denial of access along some road segments. Failure of these road segments constitute a significant loss of Forest Service infrastructure, adverse impacts to the local economy due to the loss of access and are expected to deliver sediment to streams downslope and adjacent to the road, resulting in negative effects to water quality, 303d listed impaired streams, and designated critical habitat for SONCC Coho salmon, a Federal ESA-listed fish species, and habitat suitable for UKTR Spring Chinook salmon (candidate species). Treatment recommendations are improving road drainage features, temporary site-specific closures, install warning signage, and storm patrol inspections and response to ensure treatments are functioning as intended. (KNF and SRF)

b. **Very High** risk to 9.5 miles on the KNF and 6 miles on the SRF of NFS trail prisms and associated trail infrastructure within and downslope from hillslopes burned at a high to moderate SBS due to an increased threat of erosion of trail tread, impacts to trail at crossings, trail blockage by eroded soil, stump and root burnout, dry ravel and falling burned trees. Failure of these trail segments constitute a significant loss of Forest Service infrastructure, adverse impacts to the local economy due to the loss of recreation access and are expected to deliver sediment to streams downslope and adjacent to the trail resulting in negative effects to water quality, 303d listed impaired streams, and designated critical habitat for SONCC Coho salmon, a Federal ESA-listed fish species, and habitat suitable for UKTR Spring Chinook salmon (candidate species). Treatment recommendations are improving trail drainage features, install warning signage, and monitor to ensure treatments are functioning as intended. (KNF and SRF)

c. **Very High** risk to 3 miles on the KNF of NFS trail prisms and associated trail infrastructure for the Pacific Crest National Scenic Trail (PCT) and 6 miles on the KNF of NFS trail prisms and associated trail infrastructure for the Kelsey National Scenic Trail (KNST) within and downslope from hillslopes burned at a high to moderate SBS due to an increased threat of erosion of trail tread, impacts to trail at crossings, trail blockage by eroded soil, stump and root burnout, dry ravel and falling burned trees. The PCT is one of the most popular through hikes in the world and sees

thousands of visitors annually. The trail avoids civilization and covers scenic and pristine mountainous terrain. Failure of these two trails segments constitute a significant loss of Forest Service infrastructure, an adverse impact to the local economy, and are expected to deliver sediment to streams downslope and adjacent to the trail resulting in negative effects to water quality, 303d listed impaired streams, and designated critical habitat for SONCC Coho salmon, a Federal ESA-listed fish species, and habitat suitable for UKTR Spring Chinook salmon (candidate species). Treatment recommendations are improving trail drainage features, install warning signage, and monitor to ensure treatments are functioning as intended. (KNF only)

d. **High to Intermediate** risk to stationary developed recreation site infrastructure from hazard trees at ten trailheads and five campgrounds on the KNF and one trailhead on the SRF in high to moderate SBS. Fire weakened trees pose a threat to buildings and infrastructure at these developed recreation sites (campgrounds and trailheads). See BAER VAR Table/Recreation Specialist Report for a comprehensive list of these sites. Treatments recommended include the removal of imminent hazard trees and install warning signage. These areas will need to be assessed for hazard trees as part of long-term recovery efforts. (KNF and SRF)

e. **Intermediate to Low** risk to 33.7 miles on the KNF and 25.33 miles on the SRF of NFS roads (OP ML 2-5) and associated NFS road infrastructure (such as bridges and culverts) in low SBS "stacked" above or in between roads in high to moderate SBS expected because flooding, debris flows, and erosion is possible. Post fire conditions and predicted watershed response indicate some increased runoff, debris flows, and rockfall will occur into roadway drainage features, such as such as roadside ditches, culvert inlets, over side drains, roadway dips and run outs. Once these drainage features become impacted and overwhelmed, their function fails, allowing uncontrolled water to divert, resulting in major damage to the road and invested road improvements, loss of road function, and the denial of access along some road segments. Because the risk is only intermediate to low, no treatment is justified. These road segments should be assessed as part of long-term recovery efforts. (KNF and SRF)

f. **Intermediate to Low** risk to 22.8 miles on the KNF and 30.5 miles on the SRF of NFS trail prisms and associated trail infrastructure within and downslope from hillslopes burned at a low SBS due to some increased threat of erosion of trail tread, impacts to trail at crossings, trail blockage by eroded soil, stump and root burnout, dry ravel and or falling burned trees. Failure of these trail segments constitute a significant loss of Forest Service infrastructure and are expected to deliver sediment to streams downslope and adjacent to the trail resulting in negative effects to water quality, 303d listed impaired streams, and designated critical habitat for SONCC Coho salmon, a Federal ESA-listed fish species, and habitat suitable for UKTR Spring Chinook salmon (candidate species). Because the risk is only intermediate, no treatment is justified. These trail segments should be assessed as part of long-term recovery efforts. (KNF and SRF)

g. **Low** risk to Forest Service bridges within and below the burned area from debris flow and overtopping. (KNF and SRF)

There may be an increased threat to private property, to local, county, and state roads, and to municipal water systems within and adjacent to the fire perimeter. Several private residences and local, county and state roads exist downstream from the fire area. Coordination and information sharing with landowners, Karuk Tribe, NRCS, CalTrans, NWS, USGS, and other emergency services is recommended. (KNF and SRF)

3. **Natural Resources (NR):** a. **High** risk to water quality due to increased sedimentation to both creeks (Independence Creek – KNF and Ti Bar Creek – SRF) from failure of road stream crossings. Bridges and roads are expected to be impacted by higher values of runoff and increase debris flows generated from areas of high and moderate SBS. These flows have the potential to damage both roads and/or bridges, which would cause the addition of sediment and bridge material into *Ti Creek* and *Independence Creek*. Treatment recommended is natural recovery. Impacts to water quality will benefit from the proposed roads, trails, and land treatments. (KNF and SRF)

   b. **High** risk to native plant communities, endemic sensitive plant habitats, and special botanical interest areas where invasive species or noxious weeds are absent or present in minor amounts due to the risk of invasive species spread and introduction to uninfested areas within and adjacent to the River Complex. Loss of duff, competing vegetation, and canopy cover in areas with moderate to high SBS creates a vulnerable habitat susceptible to invasion by adjacent disturbed noxious

weed sites. Treatments recommended include early detection rapid response (EDRR) surveys along suppression features created within 1 mile of disturbed infestations, 100 meters of known sensitive plant communities, near wilderness boundaries, and within moderate-high SBS areas where a likely potential for spread is determined. BAER funds are requested to treat these risks. (KNF and SRF)

c. **Intermediate to Low** risk for water quality concerns and loss of designated critical habitat for SONCC Coho salmon, a Federal ESA-listed fish species, and habitat suitable for UKTR Spring Chinook salmon (candidate species) due to the probability of increased flows resulting in flooding, excess sediment input, spillage of raw sewage, and the mobilization of hazardous materials into the waterways. For aquatic species, post-fire impacts will vary to include compromised water quality and changes in water chemistry due to ash delivery and hazardous materials, changes in water temperature from loss of canopy shading and increased sedimentation, scouring of riparian/aquatic vegetation, and changes in streambed/pool habitat due to geomorphic movement (debris flows), and flushing of individual fish downstream during flood events. Because the risk is intermediate to low, no treatment is justified. However; other proposed treatments will result in benefits to this value. (KNF and SRF)

d. **Low** risk to hydrologic function from loss of ground cover and coarse woody debris, mass erosion, flooding, and debris flows. Because the risk is low, no treatment is justified. Impacts to hydrologic functions will benefit from the proposed roads, trails, and land treatments. (KNF and SRF)

e. **Low** risk to water quality 303d listed streams from the increase in sediment delivery to the channels and loss of canopy cover. Because the risk is low, no treatment is justified. However; other proposed treatments will result in benefits to this value. (KNF and SRF)

f. **Low** risk to soil productivity. Fire decreases soil productivity primarily by removing effective ground cover and protective overstory and understory vegetation canopy. Areas exhibiting high and moderate SBS are most vulnerable to loss of surface soil through accelerated erosion and increased sediment delivery from precipitation events triggering sheet flow or concentrated runoff. In addition to a protective cover the organic and near surface mineral soil horizons store plant seeds and nutrients necessary to maintain or recover plant communities. With normal or slightly elevated precipitation rates, the soil resource in moderate to high SBS areas can be susceptible to erosive threats for 5 or more years. Extended recovery times can lead to longer term decreases in soil productivity through cumulative erosion, increased potential for the spread of invasive plant species and noxious weeds, and from unauthorized OHV intrusions due to the loss of physical and vegetative barriers. Given the soils throughout the burned area have inherently moderate to very high erosion rates, postfire soil erosion is not expected to considerably increase. Soil movement will be obvious in localized areas of moderate and high SBS areas with normal precipitation. In these locations soil erosion will be driven more by loss of vegetative cover than SBS. When considering postfire erosion is a natural ecological and geomorphic process the magnitude for estimated postfire erosion is minor over the majority of the burned area. Combined with a possible probability, risk is low to intermediate. No response actions beyond natural recovery are recommended for soil productivity. Accumulated threats to soil productivity from road and trail failures, unauthorized OHV-motorized vehicle intrusions, and establishment of invasive plants and noxious weeds will be addressed by response actions aimed at decreasing risk to other BAER critical values. (KNF and SRF).

4. **Cultural and Heritage Resources**:a. **High** risk to unauthorized artifact collection and or vandalism because newly exposed cultural resources are more vulnerable to discovery post fire. There is a threat of loss of historic context and integrity due to unauthorized artifact collection or vandalism at historic and precontact locations that are eligible or potentially eligible for listing in the National Register of Historic Places (NRHP). Cultural resources are non-renewable. In most cases, damage to cultural resource sites represent an irretrievable loss of traces of the past. Unauthorized removal of artifacts from historic contexts degrades the integrity of the cultural resources and reduces their potential to provide important information. The fire has exposed numerous recorded cultural sites. Treatment recommendations include installing signs at two FS trailheads that provide potential access to four cultural resource sites (CR-M2, CR-M3, CR-M4, CR-M5). These signs will

serve to inform the public of Antiquities Act of 1906 prohibitions against looting and vandalism. BAER funds are requested to treat these risks. (KNF only)

b. **High** risk to cultural site CR-M1 due to impacts from imminent hazard trees. Hazard trees present a threat of damage or destruction to historic properties that are eligible or potentially eligible for listing in the National Register of Historic Places (NRHP). Cultural resources are non-renewable. In most cases, damage to historic properties results in irretrievable loss of traces of the past. Treatment Recommendations are directionally fall hazard trees to mitigate threat to historic feature in site CR-M1. BAER funds are requested to treat this risk. (KNF only)

c. **Intermediate** risk to cultural site CR-M2 due to impacts from hazard trees. Hazard trees present a threat of damage or destruction to historic properties that are eligible or potentially eligible for listing in the National Register of Historic Places (NRHP). Cultural resources are non-renewable. In most cases, damage to historic properties results in irretrievable loss of traces of the past. While no imminent hazard trees were identified near the site, several fire weaken trees will continue to die off over time becoming hazard tree to this feature. Because the risk is intermediate, no treatment is justified. This site should be assessed as part of long-term recovery efforts. (KNF only)

d. **Low** risk to cultural site CR-M3 due to impacts from increased erosion. Increased erosion due to vegetation loss is already evident within artifact deposits (prefire). It is likely that the site condition will continue to worsen. The artifacts affected are already highly disturbed. They have also been previously recorded, so data loss potential is minor. (KNF only)

e. **Low** risk to sacred/cultural ceremonial sites and traditional hunting and gathering sites due to loss of access to these sites, an increased threat from increased runoff, erosion, flooding, or debris flow causing irreversible damage to native fisheries, and due to the introduction and spread of invasive species into native plant communities and sensitive plant habitats in the McCash Fire area. Because risk is low, no treatment is justified. However; other proposed treatments will result in benefits to this value. (KNF and SRF)

There are numerous NFS values that are not BAER Critical Values in addition to non-NFS values potentially at risk from post-fire threats originating primarily on NFS lands. These are summarized in a "Values at Risk" (VAR) table in the assessment project record. Treatments for these other values have not been identified. Activities to address the non-BAER Critical Values on NFS lands can be considered for the "BAR/pilot program" and or discretionary program funding. It is recommended the non-NFS values potentially threatened by post-fire conditions be communicated to the appropriate parties through interagency coordination procedures.

B. Emergency Treatment Objectives:

a. Reduce the post-fire risks to human life and safety through site-specific administrative closures, treatments, and warning signage. These site-specific administrative closures and signs also serve to accelerate natural recovery by discouraging travel off roads and trails and by preventing and or limiting access to and in high use recreation sites for the McCash Fire.
b. Protect or minimize damage to high-value NFS investments within the burned area from hazard trees, localized increased erosion and flooding and debris flows. Minimize damage to key NFS travel routes (roads and trails) within and downstream the fire boundary and to key infrastructure at critical NFS recreation sites within and immediately adjacent to the fire boundary for the McCash Fire.
c. Protect or mitigate potential post-fire impacts to critical natural resources within the burned area.
d. Survey and treat invasive plants that are a potential threat to naturalized ecosystems by minimizing the establishment of populations in the burned area and adjacent to the area where soils/vegetation was significantly disturbed as a result of fire suppression activities for the McCash Fire.
e. Assist cooperators with the interpretation of the assessment findings to identify potential post-fire impacts to communities and residences, domestic water supplies, public and private roads, and other non NFS infrastructure for the McCash Fire.
f. Reduce impacts to water quality that are designated as impaired water bodies for the McCash Fire.
g. Mitigate effects of changed post-fire watershed response on natural resources such as federally listed species, historic properties, and sacred/cultural resources for the McCash Fire.

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

Land: 50%

Channel: NA
Roads/Trails: 50%
Protection/Safety: 75%

D. Probability of Treatment Success

Table 9: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land	75	85	95
Channel	---	---	---
Roads/Trails	75	85	95
Protection/Safety	80	70*	60*
	*Initially, visitors will heed the warning signs. Complacency is expected after the initial year unless there are continued damaging events		

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

McCash - KNF - $5,122,310 is the total estimated *Monetary Value* (Direct and Loss of Use) of the Critical Values (NFS and others connected to NFS lands) within the fire perimeter. $4,610,079 is the estimated *Monetary Value Loss* for the CVs within the fire perimeter in high to moderate SBS with a 0.9 probability of experiencing the loss with no treatment and or for the no-action alternative as determined by the VAR Calculation Tool. This tool uses Risk-based Assessment to evaluate cost-effectiveness for proposed treatments to mitigate potential damage to Values-at-Risk (VAR). Analysis in this tool is based on a combination of applying benefit/cost ratios (B/C ratio) for Market Value resources and the Implied Minimum Value (IMV) method for Non-market Value resources. Analysis found here: River-McCash_VAR_CB_Worksheet_20211029_McCashKNF.pdf | Powered by Box (pg. 1)

McCash - SRF - $1,379,240 is the total estimated *Monetary Value* (Direct and Loss of Use) of the Critical Values (BAER NFS values and other connected values to NFS lands) within the fire perimeter. $1,241,316 is the estimated *Monetary Value Loss* for the CVs within the fire perimeter in high to moderate SBS with a 0.9 probability of experiencing the loss with no treatment and or for the no-action alternative as determined by the VAR Calculation Tool. This tool uses Risk-based Assessment to evaluate cost-effectiveness for proposed treatments to mitigate potential damage to Values-at-Risk (VAR). Analysis in this tool is based on a combination of applying benefit/cost ratios (B/C ratio) for Market Value resources and the Implied Minimum Value (IMV) method for Non-market Value resources. Analysis found here: River-McCash_VAR_CB_Worksheet_20211029_McCashSRF.pdf | Powered by Box (pg. 1)

F. Cost of Selected Alternative (Including Loss):

McCash - KNF - $5,122,310 is the total estimated *Monetary Value* (Direct plus Loss of Use) of the Critical Values (CVs) (NFS and nonFS values connected to NFS lands) within the fire perimeter. $4,610,079 is the estimated *Monetary Value Loss* for the CVs within the fire perimeter in high to moderate SBS with a 0.9 probability of experiencing the loss with no treatment or for the no-action alternative as determined by the VAR Calculation Tool. Risk-based Assessment estimates expected value change to threatened resources based upon the probability that a threat will occur, the cost of proposed mitigations, and the probability that the mitigation will be effective.

Actual cost of the treatments is $228,373. There is an estimated 0.9 probability of experiencing the loss with no treatment minus the estimated 0.5 probability of experiencing loss if treatment occurs establishing a reduction in probability of loss of 0.4 based on expert opinion. With an expected monetary benefit of treatments of $ $2,048,924. Implementation of recommended response actions listed below is based on market resources only and is economically justified with the following expected Benefit/Cost ratio of treatment for market resources only for the McCash – KNF portion is 9.0. The implied minimum value of protecting non-market resource values is justified. Analysis found here: River-McCash_VAR_CB_Worksheet_20211029_McCashKNF.pdf | Powered by Box (pg. 2)

McCash - SRF - $1,379,240 is the total estimated *Monetary Value* (Direct plus Loss of Use) of the Critical Values (BAER NFS values and other connected values to NFS lands) within the fire perimeter. $1,241,316 is the estimated *Monetary Value Loss* for the CVs within the fire perimeter in high to moderate SBS with a 0.9 probability of experiencing the loss with no treatment or for the no-action alternative as determined by the VAR Calculation Tool. Risk-based Assessment estimates expected value change to threatened resources based upon the probability that a threat will occur, the cost of proposed mitigations, and the probability that the mitigation will be effective.

Actual cost of the treatments is $158,037. There is an estimated 0.9 probability of experiencing the loss with no treatment minus the estimated 0.5 probability of experiencing loss if treatment occurs establishing a reduction in probability of loss of 0.4 based on expert opinion. With an expected monetary benefit of treatments of $551,696 Implementation of recommended response actions listed below is based on market resources only and is economically justified with the following expected Benefit/Cost ratio of treatment for market resources only for the McCash – SRF portion is 3.5. The implied minimum value of protecting non-market resource values is justified. Analysis found here: River-McCash_VAR_CB_Worksheet_20211029_McCashSRF.pdf | Powered by Box (pg. 2)

No other alternatives were analyzed other than the no action and the action alternative as described below. The VAR analysis focused primarily on market values so potential benefits such as lowering level of risk to human life and safety, natural resources, and cultural resources were recognized in this BAER assessment, but not included in the cost basis for Values at Risk analysis.

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Mary Moore
Email: mary.c.moore@usda.gov **Phone(s):** 719-486-4872

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

SRF Forest BAER Coordinator: AJ Donnell, Six Rivers National Forest
Email: aaron.donnell@usda.gov **Phone(s):** 417-224-2491

Team Members:

Table 10: BAER Team Members by Skill

Skill	Team Member Name
Team Lead(s)	Mary Moore
Soils	Terry Hardy, Leslee Crawford (t)
Hydrology	Emily Fudge, Luke Rutten, Steve Bachmann, Anna Chinchilli (t)
Geology	Derek Beal
Engineering	Larry Arlington, Samuel Marano, Benjamin Molitor, John Weddle III
GIS	Marilyn Porter, Daniel Reinkensmeyer
Archaeology	Jacob Batisky, Robin Hopkins, Michael Kellett
Weeds/Botany	Erin Lonergan
Recreation	Erik Rademacher, Karl Dietzler
Fish	Maija Meneks (t)
Logistics	Diane Cross

Skill	Team Member Name
Information	Cathleen Thompson

Treatment Maps found here: (106) Treatment Maps | Powered by Box

Treatment Narrative:

Land Treatments:

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. Survey and treatment locations were selected based on soil burn severity and proximity to known infestations and sensitive resources such as the Marbles Mountain Wilderness, sensitive native plant communities, and recreation sites.

Early Detection Rapid Response (EDRR) for threats related to suppression disturbances (KNF and SRF):

Klamath (KNF): Detection surveys are proposed along 14.5 miles of dozer line, and 16.5 miles of road improved as line.

Six Rivers (SRF): Detection surveys are proposed along 8.7 miles of dozer line, 2.8 miles of handline and 49 miles of road improved as line.

Table 11: Initial Cost estimate for EDRR treatments along suppression features on the Klamath National Forest (KNF). Funding breakdown is based on estimated rates for the Mid-Klamath Watershed Council, a local watershed group that is best suited to conduct the proposed work.

ITEM	UNIT	UNIT COST	# OF UNIT	TOTAL COST
FIELD TECHNICIANS (3)	Day	$580	15	$8,700
CREW LEAD	Day	$250	15	$3,750
FIELD PER DIEM (4)	Day	$120	15	$1,800
SUPPLIES	Lump Sum	$120	1	$120
VEHICLE AND FUEL	Week	$600	3	$1,800
TOTAL				**$16,170**

Table 12: Initial Cost estimate for EDRR treatments along suppression features on the Six Rivers National Forest (SRF). Funding breakdown is based on estimated rates for the Mid-Klamath Watershed Council, a local watershed group that is best suited to conduct the proposed work.

ITEM	UNIT	UNIT COST	# OF UNIT	TOTAL COST
FIELD TECHNICIANS (3)	Day	$580	20	$11,600
CREW LEAD	Day	$250	20	$5,000
FIELD PER DIEM (4)	Day	$120	20	$2,400
SUPPLIES	Lump Sum	$110	1	$110
VEHICLE AND FUEL	Week	$600	4	$2,400
TOTAL				**$21,510**

Early Detection Rapid Response (EDRR) for post-fire threats not related to suppression disturbances (KNF and SRF).

Klamath (KNF): Detection surveys are proposed along 2.5 miles of trail between Norcross and Bear Lake trailheads and along segments of road 14N05 (Independence creek road) near the Wilderness boundary. Both proposed areas burned at high SBS and have known infestations present nearby. Treatments at Bear Lake,

Norcross, and Sulphur Springs trailhead. All of these sites burned at moderate to high SBS and had known noxious weeds nearby creating a high risk for invasion up trail systems and into sensitive native plant communities.

Six Rivers (SRF): Detection surveys are proposed along roads 13N02 and 14N01 which run through moderate to high SBS areas of the burn. Both roads have known infestations that are a high risk for spread into vulnerable burned communities.

Table 13: Initial Cost estimate for EDRR treatments within moderate to high burn SBS areas on the Klamath National Forest (KNF). Funding breakdown is based on estimated rates for the Mid-Klamath Watershed Council, a local watershed group that is best suited to conduct the proposed work.

ITEM	UNIT	UNIT COST	# OF UNIT	TOTAL COST
FIELD TECHNICIANS (3)	Day	$580	5	$2,900
CREW LEAD	Day	$250	5	$1,250
FIELD PER DIEM (4)	Day	$120	5	$600
VEHICLE AND FUEL	Week	$600	1	$600
TOTAL				**$5,350**

Table 14: Initial Cost estimate for EDRR treatments within moderate to high burn SBS areas on the Six Rivers National Forest (SRF). Funding breakdown is based on estimated rates for the Mid-Klamath Watershed Council, a local watershed group that is best suited to conduct the proposed work.

ITEM	UNIT	UNIT COST	# OF UNIT	TOTAL COST
FIELD TECHNICIANS (3)	Day	$580	5	$2,900
CREW LEAD	Day	$250	5	$1,250
FIELD PER DIEM (4)	Day	$120	5	$600
VEHICLE AND FUEL	Week	$600	1	$600
TOTAL				**$5,350**

Cultural Resource Site Protection Treatment and Advisory Signs (KNF only)

CR-M1 (KNF only): *Hazard Tree Removal:* On the Klamath NF one Cultural Resource site was identified as being at risk from imminent hazard trees weakened by the burn. At least 3 burned snags are within striking distance of a character defining feature of this historic site. A strike from any of these snags would result in irreparable damage and would jeopardize the site's potential eligibility for the NRHP. The treatment would require a three-person Saw Team to directionally fall the snags away from the feature. One Archaeologist should also be on-site to indicate where to drop the trees to avoid damaging other historic features in the area. The expertise of the Saw Team should also be utilized to identify if there are additional snags in the immediate area that threaten the cultural site.

Table 15: Initial Cultural Stabilization – Hazard Tree Removal (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
FORESTRY TECHNICIAN SAW TEAM*	Each	$550	1	$550
ARCHAEOLOGIST*	Each	$289	1	$289
TOTAL				**$839**

**OT rate only. Base 8 salary for local on Forest Staff is not included in this total.*

CR-M2, CR-M3, CR-M4, CR-M5 (KNF only): *Sign Installation:* On the Klamath NF four Cultural Resource sites were identified as needing emergency treatments. The recommended treatment is the placement of "Notice" signs at two trailheads that provide access to these four sites. Due to the sites' locations within moderate to high SBS, artifacts may be highly visible from the trail. There is potential for irreversible data loss if artifacts are looted from any of the sites. The hanging of advisory signs would be conducted by a Recreation Technician or third party. An Archaeology Technician should also be present to direct placement and document the activity.

Effectiveness monitoring of the notice signs should be carried out 3 times per year for 3 years to ensure there is no data loss within the site. Funding for effectiveness monitoring should be requested as part of an interim request after BAER implementation.

Table 16: Initial Cultural Stabilization – Advisory Signs (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TRAILHEAD SIGN	Each	$20	2	$40
RECREATION TECHNICIAN*	Each	$213	1	$213
ARCHAEOLOGICAL TECHNICIAN*	Each	$213	1	$213
TOTAL				**$466**

**OT rate only. Base 8 salary for local on Forest Staff is not included in this total.*

Channel Treatments: NA

Roads and Trail Treatments:

Road Stabilization (KNF and SRF):

Increased runoff resulting from burned slopes which are adjacent to roads will cause damage to high value NFS property such as roadway surfaces and drainage structures, and increase associated threats to Human Life and Safety (loss of ingress/egress) and Natural Resources (site specific areas of soil productivity, 303d impaired waterbodies, and damage to designated Coho Critical Habitat and spring-run Chinook habitat) unless treatments are implemented to minimize the effects from the post fire flows. The purpose of this treatment is to mitigate additional risk to Human Life and Safety, property, emergency ingress/egress, loss of access to visitors and local residents, and impacts to water quality, riparian areas, and designated Coho Critical Habitat (listed species) and spring-run Chinook habitat (eligible to be listed species). For the purpose of BAER, road infrastructure (OP ML 2-5) within areas of moderate to high SBS areas was prioritized for both inspection and treatment. Road mileage data from these roads are 25.78 miles for the Klamath NF and 10.12 miles for the Six Rivers NF. Because of time constraints, road conditions, and hazards present during the inspection phase, visual inspection of roads was limited to an estimated 26.9 miles. Initial request includes the treatments required to remedy increased runoff and erosion resulting from the burn area which are directly adjacent to roads in moderate to high SBS. Initial treatments include culvert cleaning; ditch cleaning; CMP installation or replacement (See specialist report for Independence and Ten Bear Road - ENG McCash Report.docx | Powered by Box) and template reshaping to provide positive drainage to ditches and culverts. Imminent hazard trees shall be removed as directed by the Engineer, to create a safe work environment at each work site.
Brief objectives and description of the road stabilization treatments are as follows:

1) Install Drop Inlet Lid
   I. Objective: Replace Burned Drop Inlet Lid to protect drop inlet and associated culvert from debris.
   II. Description: Lid to completely cover top of drop inlet.
2) Drainage Restoration
   I. Objective: To restore existing drainage features to prefire conditions to prepare for increased runoff and debris flows
   II. Description: Cleaning of existing drainage features such as culverts ditches, dips, and other features present on road
3) Install Drop Inlet
   I. Objective: Protect pipe drainage from debris and deposition.
   II. Description: Install vertical CMP(corrugated metal pipe) riser at the inlet end of pipe.
   III. Removal of hazardous waste/unsafe burnt materials from Forest Service lands
4) Install 18-Inch CMP pipe
   I. Objective: To install outlet pipes, where existing pipe (Aluminum) was severely damaged by fire, on the fill slope sections of road to divert water down away from road prism
   II. Description: Remove damaged portion of culvert and install 18-inch CMP

Table 17: Initial Road Stabilization (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
RESTORE DRAINAGE	Mile	$7,000	11.80	$82,600
DROP INLET LID	Each	$350	40	$14,000
DROP INLET INSTALL	Each	$1,450	1	$1,450
EQUIPMENT RENTAL	Week	$3,000	1	$3,000
18" CMP	Foot	$100	450	$45,000
24" CMP	Foot	$100	40	$4,000
TOTAL				**$150,050**

**Base 8 salary for on forest force account crews is not included in this total. Some work to be performed by third party contractors.*

Table 18: Initial Road Stabilization (SRF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
RESTORE DRAINAGE	Mile	$7,000	4.24	$29,680
INSTALL DROP INLET	Each	$1,450	7	$10,150
REPLACE DROP INLET LID	Each	$350	19	$6,650
18" CMP	Foot	$100	210	$21,000
EQUIPMENT RENTAL	Week	$3,000	1	$3,000
TOTAL				**$70,480**

**Base 8 salary for on forest force account crews is not included in this total. Some work to be performed by third party contractors.*

Trails Stabilization (KNF and SRF):

There are 8.06 miles of trail on slopes greater than 20% in moderate to high SBS on KNF lands, and 4.4 miles of the same on SRF-administered lands. All require post fire storm proofing to ensure future storm events won't cause damage. Post-fire impacts generally increase surface runoff and debris damage on these trails, which represent an approximate combined $1,300,000 Forest Service investment. Post-fire storm proofing includes improving drainage and armoring burned stump holes. A conservation crew of four with a Trail Technician for oversight, plus Pack stock support are expected to complete about one mile of post-fire drainage and armoring per day in these areas. Due to the remote location of most of these trail segments, mileage per day estimates include one day of crew travel to and from work sites, plus pack stock supply support over a standard eight-day assignment. Winter and summer weather events are expected to impact this high-value infrastructure into the future.

Table 19: Initial Trail Stabilization (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-7 TRAILS TECH	Day	$250	10	$2,500
CONTRACT CREW, 4	Day	$1,200	10	$12,000
PER DIEM	Day	$42	10	$420
FLEET VEHICLE DAY & MILEAGE	Day	$27.6	10	$276
PACK SUPPORT	Day	$1,500	4	$6,000
TOTALS				**$21,196**

**Base 8 salary for on forest force account personnel is not included in this total. Some work to be performed by third party/partner.*

Table 20: Initial Trail Stabilization (SRF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-7 TRAILS TECH	Day	$250	6	$1,500

CONTRACT CREW, 4	Day	$1,200	6	$7,200
PER DIEM	Day	$42	6	$252
FLEET VEHICLE DAY & MILEAGE	Day	$27.6	6	$166
PACK SUPPORT	Day	$1,500	2	$3,000
TOTALS				**$12,118**

**Base 8 salary for on forest force account personnel is not included in this total. Some work to be performed by third party/partner.*

Trail Stabilization – PCT and Kelsey National Scenic Trail (KNF only)

There is 2.91 miles of the Pacific Crest National Scenic Trail (PCT) running through the fire perimeter. The PCT is an extremely popular through hike, visited by people from all 50 states and from countries around the world annually. Because of its status, the BAER team considers it to be of particular importance. The National Recreation designation and historic significance of the Kelsey trail also elevates its significance. There are 5.5 miles of the Kelsey National Scenic Trail in the fire footprint. The trail tread is at risk from increased runoff, erosion, and debris flows. Post-fire storm proofing includes improving drainage and armoring erosion-prone burned stump holes. The magnitude of consequences is moderate (even in lower SBS classes). The resulting risk is high. Because of the national designation status of the two trails, plus different trail construction standards for the PCT (specifically gradient and width design standards), the team feels that typical trail wildfire impacts in all burn severities should be included. The two 8.41-mile segments represent an approximate $850,000 investment. A conservation crew of four with a Trail Technician for oversight plus Stock Pack Support are recommended and expected to complete about one mile of post-fire drainage and armoring per day. Due to the remote location of most of these trail segments, mileage per day is estimated to include one day of crew travel to and from work sites, plus pack stock supply support over a standard eight-day assignment. Winter and summer weather events are expected to impact this high-value infrastructure into the future.

Table 24: Initial Trail Stabilization - PCT (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-7 TRAILS TECH	Day	$250	4	$1,000
CONTRACT CREW, 4	Day	$1,200	4	$4,800
PER DIEM	Day	$42	4	$168
FLEET VEHICLE DAY & MILEAGE	Day	$27.75	4	$111
PACK SUPPORT	Day	$1,500	2	$3,000
TOTALS				**$9,079**

**Base 8 salary for on forest force account personnel is not included in this total. Some work to be performed by third party/partner.*

Table 25: Initial Trail Stabilization - KNST (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-7 TRAILS TECH	Day	$250	6	$1,500
CONTRACT CREW, 4	Day	$1,200	6	$7,200
PER DIEM	Day	$42	6	$252
FLEET VEHICLE DAY & MILEAGE	Day	$27.6	6	$166
PACK SUPPORT	Day	$1,500	2	$3,000
TOTALS				**$12,118**

**Base 8 salary for on forest force account personnel is not included in this total. Some work to be performed by third party/partner.*

Protection/Safety Treatments:

Protection and Safety - Roads (KNF and STF)

Initial request includes the minimal treatment required to remedy road template degradation caused by woody debris/tree and other vegetation roots encapsulated in, by and years of propagation adjacent to road prism. The woody debris/tree and other vegetation roots have burnt and caused large voids in road prism. Treatments include using equipment to remove lingering woody debris, filling, and compaction of voids with adjacent natural surface materials or rock.

Table 21: Initial Protection and Safety Treatments. (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
BURN HOLE REPAIR	EA	$1,000	6	$6,000
TOTAL				**$6,000**

**Base 8 salary for on forest force account crews is not included in this total. Some work to be performed by third party contractors.*

Table 22: Initial Protection and Safety Treatments. (SRF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
BURN HOLE REPAIR	EA	$1000	19	$19,000
BURN HOLE REPAIR (ASPHALT)	EA	$1500	17	$25,500
TOTAL				**$44,500**

**Base 8 salary for on forest force account crews is not included in this total. Some work to be performed by third party contractors.*

Warning Signs – Roads (KNF and SRF)

The overall purpose of this treatment is to reduce risks to human life and safety by warning motorists and/or Forest visitors of existing threats while traveling within and downstream of the burned area. "Entering Burned Area" signs are needed to alert the public of possible threats to their life and safety that exist within or downstream of a burned area. The signs contain language specifying items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, debris flows, and flash floods.

The installation of warning signs at major entry points into the burn will inform road users of the potential for hazards within the burn area. Signs will be installed on roads that access the burn area. The signs are 36"x24" orange signs (High Visibility) and will be placed at a height and location that maximizes visibility.

Table 23: Initial Warning Signs – Roads (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
ROAD WARNING SIGNS	Each	$350	6	$2,100
TOTAL				**$2,100**

**Base 8 salary for on forest force account crews is not included in this total. Some work to be performed by third party contractors.*

Table 24: Initial Warning Signs – Roads (SRF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
ROAD WARNING SIGNS	Each	$350	4	$1,400
TOTAL				**$1,400**

**Base 8 salary for on forest force account crews is not included in this total. Some work to be performed by third party contractors.*

Warning Signs – Trailheads, Campgrounds, and River Access Sites (KNF and SRF)

On KNF lands, there are ten trailheads, three campgrounds within (or directly accessing burned areas), as well as three river access sites below drainages impacted by the burn. On SRF-administered lands, there are six trailheads within, (or directly accessing burned areas) and eight river access sites below drainages impacted by the burn. There is a human health and safety risk to visitors at these sites due to fire and post-fire impacts,

including imminent hazard trees, flooding, flood debris, rolling rocks, burned out stump holes, and debris flows. The probability of damage or loss to human health and safety is possible for these areas. The magnitude of consequences is major, as impacts to these threats could lead to loss of life or injury. The resulting risk to human health and safety is high. The BAER Team recommends warning signage to be posted at the trailheads within (or with trails leading to and within the fire perimeter), and at river access sites where there is the potential for visitors and boaters to experience flooding and fire-generated debris.

Table 25: Initial Warning Signs – Trailheads, CGs, River Access (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TRAIL & CG WARNING SIGNS	Each	$15	16	$240
POST & MISC HARDWARE	Each	$20	16	$320
GS-7 FORESTRY TECH	Day	$250	5	$1,250
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	4	$111
TOTALS				**$1,921**

**Base 8 salary for on forest force account personnel is not included in this total. Some work to be performed by third party/partner.*

Table 26: Initial Warning Signs – Trailheads, CGs, River Access (SRF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TRAIL & CG WARNING SIGNS	Each	$15	14	$210
POST & MISC HARDWARE	Each	$20	14	$280
GS-7 FORESTRY TECH	Day	$250	4	$1,000
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	4	$111
TOTALS				**$1,601**

**Base 8 salary for on forest force account personnel is not included in this total. Some work to be performed by third party/partner.*

Recreation Site Protection and Stabilization (KNF and SRF)

There is a threat to infrastructure at two trailheads within moderate to high SBS of KNF lands (Bear Lake and Johnson's Hunting Grounds), and two trailheads on SRF-administered lands (Ten Bear and Stanshaw). Fire weakened or killed hazard trees pose threats to vault toilets, information sign kiosks, signs, and stock corrals. The probability of damage or loss is likely. The magnitude of consequences is moderate. The trailhead infrastructure is well maintained annually and most receive a moderate volume of use. The resulting risk is high, since replacement costs for these facilities varies by site (and facility type), but generally average in the low thousands of dollars between time and materials, and the potential for contracting. Additionally, it will be necessary to keep forest users and visitors from engaging with unsafe partially burnt structures. The BAER team recommends the removal of imminent hazard trees and removal and proper dispose of any burned infrastructure from these locations.

Table 27: Initial Recreation Site Protection and Stabilization (KNF) Cost Estimate.

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
FS-9 FORESTRY TECH FOR HAZ TREE ID	Day	$300	1	$300
FALLING TEAM	Day	$1,200	1	$1,200
FLEET VEHICLE DAY & MILEAGE	Day	$28	1	$28
TOTALS				**$1,528**

**Base 8 salary for on forest force account personnel is not included in this total. Some work to be performed by third party/partner.*

Table 28: Initial Recreation Site Protection and Stabilization (SRF) Cost Estimate.

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
FS-9 FORESTRY TECH FOR HAZ TREE ID	Day	$300	1	$300
FALLING TEAM	Day	$1,200	1	$1,200

FLEET VEHICLE DAY & MILEAGE	Day	$28	1	$28
TOTALS				**$1,528**

**Base 8 salary for on forest force account personnel is not included in this total. Some work to be performed by third party/partner.*

Storm Inspection Roads (KNF only):

The overall purpose of this treatment is to reduce the potential for loss and further damage to Forest roads and bridges as a result of storm events. In addition, the treatment reduces the risk to site specific areas of soil productivity, 303d impaired waterbodies, and damage to designated Coho Critical Habitat and spring-run Chinook habitat by mitigating the additional loss of infrastructure and associated sediment/debris that in turn causes an impact to water quality and riparian areas.

Roads within the fire perimeter contain drainage structures that cross intermittent and perennial streams located in watersheds that have a moderate to high SBS. These streams now have the potential for increased runoff and debris flows. These increases in flows pose a threat to the existing crossings which may result in plugging culverts or exceeding their maximum flow capacity. If these flows plug drainage structures, the result will likely be additional erosion and debris further down the drainage due to the failures of the fill slopes of the roads.

For the purpose of BAER, road infrastructure (OP ML 2-5) within areas of moderate to high SBS areas was prioritized for both inspection and treatment. Road mileage data from these roads are 25.78 miles for the Klamath NF and 10.12 miles for the Six Rivers NF. Initial Request includes post-storm inspection for roads. Immediately upon receiving heavy rain and spring snowmelt the FS will send out patrols to identify road hazardous conditions. Observations and corrective actions are identified before they worsen, jeopardize motor vehicle users and/or road tread.

Table 29: Initial Storm Inspection Roads (KNF) Cost Estimate. Initial Request includes post-storm response and Inspection for roads. Observations and corrective actions are identified in post-storm inspections. Emergency action may be required before they worsen, jeopardize motor vehicle users and/or road tread

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
***STORM INSPECTION AND RESPONSE**	Mile	$550	2.83	$1,556
TOTAL				**$1,556**

**Base 8 salary for on forest force account crews is not included in this total. Some work to be performed by third party contractors.*

Tribal Monitoring/Consultation (KNF and SRF):

There is an MOU (memorandum of understanding) between the Karuk Tribe and the Klamath and Six Rivers National Forests for conducting Government to Government Consultation. Karuk Tribe's active involvement with the two Forests during management of wildland fire incidents and subsequently during BAER, has helped raise awareness regarding the value of incorporating Karuk Traditional Ecological Knowledge into implementation strategies to better protect important tribal values. Several sites of interest to the Karuk tribe were identified during fire suppression and the BAER process for the McCash Fire area. Continued support and coordination with the Designated Tribal Government Representative is recommended prior to project implementation in the McCash Fire area.

Table 30: Initial Tribal Monitoring and Consultation (KNF)

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
DESIGNATED TRIBAL GOVERNMENT REPRESENTATIVE	Days	$550	2	$1,100
TOTAL				**$1,100**

Table 31: Initial Tribal Monitoring and Consultation (SRF)

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
DESIGNATED TRIBAL GOVERNMENT REPRESENTATIVE	Days	$550	2	$1,100
TOTAL				**$1,100**

Extended Interagency Emergency Coordination (KNF and SRF):

This involves continued communication and coordination with other federal, state, and local agencies with jurisdiction over lands where life and property are at risk from post-fire conditions. The River Complex may need follow-up activities due to the complexity of land ownership and identified threats. Actions include but are not limited to coordinating and permitting treatments across administrative boundaries, cooperating with other agencies on hazard notification systems, permitting and installing rain gages and soil moisture instruments to monitor conditions within the burn in support of the U.S. Geological Survey (USGS) and or the two National Weather Service (NWS) forecasting centers, and exchanging information and coordinating the BAER implementation plan as needed when subsequent plans are developed by other agencies (such as NRCS and or CAL OES) and or the post-storm FS assessment process has been completed. *This treatment is currently unfunded*. It is anticipated that duties will occur with on Forest personnel and within their regular work week/base 8 day. Additional coordination needs may ensue, costs for which may exceed beyond on Forest personnel's regular work week/base 8 day will need to be requested through an interim 2500-8.

I. Monitoring Narrative:
Forest personnel will conduct implementation monitoring of the BAER treatments to check that treatments are present and functioning properly.

This report is an initial funding request based on a rapid assessment. If additional treatment needs are identified through more site specific on the ground investigation in cooperation with interested agencies, or through further field analysis location or noxious weed detection surveys, interim requests for additional funding will be filed. These funding requests will identify the purpose for each treatment, and specific treatment specifications, locations, and number of each treatment. A detailed implementation and treatment effectiveness monitoring plan will be submitted as a separate document for each fire to the Regional BAER coordinator.

PART VI – KLAMATH NF EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

		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										
EDRR - Supression	miles	522	31	$16,170	$0		$0		$0	$16,170
EDRR - H/M Burn Area	miles	2,140	2.5	$5,350	$0		$0		$0	$5,350
Cultural	each	435	3	$1,305	$0		$0		$0	$1,305
Subtotal Land Treatments				$22,825	$0		$0		$0	$22,825
B. Channel Treatments										
				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
Road Stabilization	miles	5,820	26	$150,050	$0		$0		$0	$150,050
Trail Stabilization	miles	2,231	10	$21,196	$0		$0		$0	$21,196
Trail Stabilization - PCT	miles	3,026	3	$9,079	$0		$0		$0	$9,079
Trail Stabilization - KNST	miles	2,020	6	$12,118	$0		$0		$0	$12,118
Subtotal Road and Trails				$192,443	$0		$0		$0	$192,443
D. Protection/Safety										
Burnt Hole Repairs	each	1,000	6	$6,000	$0		$0		$0	$6,000
Warning Signs - Roads	each	350	6	$2,100	$0		$0		$0	$2,100
Warning Signs - Trails	each	120	16	$1,921	$0		$0		$0	$1,921
Protection&Safety-RecSite	each	764	2	$1,528	$0		$0		$0	$1,528
Storm Partol	miles	550	2.83	$1,556	$0		$0		$0	$1,556
Tribal	days	2	550	$1,100	$0		$0		$0	$1,100
Interagency Coordination				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$14,205	$0		$0		$0	$14,205
E. BAER Evaluation										
Initial Assessment	Report	1	$72,500	$72,500	$0		$0		$0	$0
Subtotal Evaluation				-	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$229,473	$0		$0		$0	$229,473
Previously approved				$0						
Total for this request				$229,473						

PART VII - KLAMATH NF APPROVALS

1. Rachel Smith Digitally signed by Rachel Smith Date: 2021.11.05 12:35:52 -07'00' 11/5/21

Forest Supervisor Date

PART VI – SIX RIVERS NF EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

			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										
EDRR - Supression	miles	356	60.5	$21,510	$0		$0		$0	$21,510
EDRR - H/M Burn Area	miles	1,783	3	$5,350	$0		$0		$0	$5,350
Subtotal Land Treatments				$26,860	$0		$0		$0	$26,860
B. Channel Treatments										
				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
Road Stabilization	miles	6,964	10	$70,480	$0		$0		$0	$70,480
Trail Stabilization	miles	2,020	6	$12,118	$0		$0		$0	$12,118
Subtotal Road and Trails				$82,598	$0		$0		$0	$82,598
D. Protection/Safety										
Burnt Hole Repairs	each	1,236	36	$44,500	$0		$0		$0	$44,500
Warning Signs - Roads	each	350	4	$1,400	$0		$0		$0	$1,400
Warning Signs - Trails	each	114	14	$1,601	$0		$0		$0	$1,601
Protection&Safety-RecSite	each	764	2	$1,528	$0		$0		$0	$1,528
Tribal	days	2	550	$1,100	$0		$0		$0	$1,100
Interagency Coordination				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$50,129	$0		$0		$0	$50,129
E. BAER Evaluation										
Initial Assessment	Report	1	$72,500	$72,500	$0		$0		$0	$0
Subtotal Evaluation				-	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				**$159,587**	$0		**$0**		**$0**	**$159,587**
Previously approved				$0						
Total for this request				**$159,587**						

PART VII - SIX RIVERS NF APPROVALS

1. _____ Digitally signed by TED MC ARTHUR Date: 2021.11.05 14:23:00 -07'00'

Forest Supervisor Date