Date of Report: 11/3/2021

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: River Complex (Haypress-Summer and Cronan Fires)

B. Fire Number: CA-KNF-006385

C. State: CA

D. County: Siskiyou Co. and Trinity Co.

E. Region: R5

F. Forest: Klamath (KNF); and Shasta-Trinity (SHF)

G. Districts: Haypress-Summer: KNF - Salmon River RD and Scott River RD; SHF – Big Bar RD and Weaverville RD and Cronan: KNF - Salmon River RD

H. Fire Incident Job Code: P5N7CM (0505)

I. Date Fire Started: 07/30/2021

J. Date Fire Contained: Est. 11/01/2021

K. Suppression Cost: $92M as of 10/17/2021

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

1. **Fireline repaired (miles):** KNF – 180.7 miles; SHF – 115.7 miles
2. **Other (identify):** KNF – 23 drop point, 9 helispots, 3 safety zones, and 10 staging area locations; SHF – 11 drop point, 12 helispots, 2 safety zones, and 2 staging area locations.

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
Coffee Creek	74,776	47,514	64
East Fork Scott River	73,876	839	1
French Creek-Scott River	115,218	9,309	8
New River	149,481	1,792	1

Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
North Fork Salmon River	130,394	4,821	4
North Fork Trinity River	97,405	20,202	21
Salmon River	69,349	7	0
South Fork Salmon River	185,588	51,389	28
Swift Creek-Trinity River	120,961	1,703	1
Tangle Blue Creek-Trinity River	101,315	2,664	3

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

Ownership	Acres
NFS - KNF	99,873
NFS - SHF	100,394
Other	8,091
Total	**208,358**

O. Vegetation Types: The River Complex burned through vegetative communities ranging in elevation from approximately 1,670 feet to 8,950 feet. This dramatic elevation gradient spans many different habitat types and includes an astounding diversity of conifers. Over 13 species of conifer can be found within the burn area including Doug fir (Pseudostuga menziesii (Mirb.), incense cedar (Calocedrus decurrens (Torr.) Florin, white fir (Abies concolor (Gordon & Glend.) Lindl. ex Hildebr.), ponderosa pine (Pinus ponderosa Douglas ex Lawson & C. Lawson), Jeffrey pine (Pinus jeffreyi Grev. & Balf.), sugar pine (Pinus lambertiana Douglas), lodgepole pine (Pinus contorta ssp murrayana (Grev. & Balf.) Critchf.), foxtail pine (Pinus balfouriana Grev. & Balf), whitebark pine (Pinus albicaulis Engelm.), white fir (Abies concolor (Gordon & Glend.) Lindl. ex HIldebr.), red fir (Abies magnifica A. Murray bis), mountain hemlock (Tsuga mertensiana (Bong.) Carriere), and Pacific yew (Taxus brevifolia Nutt.). Understory species common throughout the burn area include black oak (Quercus kelloggii Newb.) dogwood (Cornus nutallii Audubon), green leaf manzanita (Arctostaphylos patula Greene), pinemat manzanita (Arctostaphylos nevadensis A. Gray), huckleberry oak (Quercus vaccinifolia Kellogg), sadler oak (Quercus sadleriana R. Br. ter) buck brush (Ceanothus cuneatus (Hook) Nutt.), snow brush (Ceanothus velutinus Douglas) and pinemat (Ceanothus prostrates Benth.). Riparian areas are dominated by big leaf maple (Acer macrophyllum Pursh), white alder (Alnus rhombifolia Nutt.) with understories of gooseberry (Ribes spp.), snowberry (Symphoricarpos albus (L.) S/ F. Blake), wild rose (Rosa gymnocarpa Nutt.), and umbrella plant (Darmera peltata (Torr. ex Benth.) Voss). Aspen groves, wet meadows and Darlingtonia fens are also scattered throughout the burn area providing habitat for an array of rare and endemic plant species.

P. Dominant Soils: Dominant soils are Dystic Xerocrepts (58%) predominantly from granitic parent material with 24 other soil types comprising 21% of the burned area. The landscapes reveal roughly 20% rock outcrop primarily across the high elevation ridgelines and areas having 70% or greater slopes. Surface soil textures are primarily gravelly loam (68%) and sandy loam (30%). Hillslope topography derived from GIS data for 0-20% slopes - 8%; 20-40% slopes - 24%; 40-60% slopes – 45%, and greater than 60% slopes - 23%. The gravelly loam and sandy loam soils have moderate to very high inherent surface erosion ratings. Runoff potential for fine-textured loamy soils is defined by soil hydrologic group (HSG) B; the coarse sandy loam soils, gravel/small rock cover over surface soils, rock outcrops and rock talus slopes fall into HSG C or D.

Q. Geologic Types: The River Complex lies within the Klamath Mountain physiographic province. The Cronan Fire area is within the Western Paleozoic and Triassic Terrane but is predominantly underlain with Jurassic aged granodiorite and quartz diorite of the English Peak Batholith. The western most portion of the Cronan Fire is underlain by Permian to Jurassic metamorphosed sedimentary rock predominately argillite with lenses of chert of the Sawyers Bar Terrane. The Haypress-Summer Fire area is spilt by the Eastern Klamath Belt in the east, the Central Metamorphic Terrane in the middle, and the Western Paleozoic and Triassic Terrane in the west. The bedrock is composed of Ordovician-Devonian peridotite and serpentines of the Trinity Terrane within the Eastern Klamath Belt, Devonian mica shist, and Devonian limestone from the Sultan Limestone Formation and impure marble and amphibole of the Central Metamorphic Belt, and

Permian to Jurassic argillite and metamorphosed volcanic rocks of the Sawyers Bar Terrane of the Western Paleozoic and Triassic Belt. This area experienced extensive volcanism during the Cretaceous period which is now evidenced by several exposed plutons. Tonalite of Craggy Peak Pluton, granodiorite and diorite of the Deadman Peak Pluton, diorite and tonalite of the China Creek Pluton, tonalite and trondhjemite of the Sugar Pine Butte Pluton, and the diorite of the Caribou Mountain Pluton are the most notable.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

Stream Type	Miles of Stream
Connector	1
Canal/Ditch	3
Pipeline	1
Intermittent	372
Perennial	441
Ephemeral	218
Artificial Path	6
Total	1,042

S. Transportation System:

Trails: *National Forest (miles):* KNF – 125.5; SHF – 151 *Other (miles):* Private - 0.4

Roads: *National Forest (miles):* see table below *Other: Non USFS Roads (miles):* County, Parish, Borough – 21.8; Private – 0.2

Table 4: Roads: National Forest (miles)

	KNF	*SHF*
Level 1 - Administrative Use	20.6	7.1
Level 2 - High Clearance Vehicle	94.4	10.3
Level 3-5 - Passenger Vehicles	13.4	4.8
TOTAL	**128.4**	**22.2**

PART III - WATERSHED CONDITION

A. Soil Burn Severity (SBS) (acres): RiverComplexPublicBAER_SBS.pdf | Powered by Box

Table 5: Soil Burn Severity Acres by Ownership

Soil Burn Severity	NFS - KNF	NFS - SHF	Other	Total
Unburned	36,109	30,548	1,460	68,117
Low	37,316	29,918	1,941	69,175
Moderate	24,283	33,141	3,387	60,811
High	2,165	6,787	1,303	10,255
Total	99,873	100,394	8,091	208,358

B. Water-Repellent Soil (acres): 59,958 (29%)

An estimated 19% of the burn area is predicted to exhibit strong or medium, fire-induced water repellency at the mineral soil surface. This surface repellency is expected to be temporary, breaking up within 1 to 3 years. Discontinuous subsurface water repellency was found from 2-6 cm. Discontinuous background water repellency was noted in low SBS and unburned areas. Estimated as a function of inherent repellency that varies by soil texture as influenced by SBS (Table 6).

Table 6: Water Repellent Soils by Strength Class (acres)

Water Repellency	Acres	Percent of Fire
None	148,400	71
Weak	20,836	10

Medium	14,726	7
Strong	24,396	12
Total	208,358	

C. Soil Erosion Hazard Rating:

Table 7: Soil Erosion Hazard Rating

Erosion Hazard	Acres	Percent of Fire
Low	8,020	4
Moderate	48,240	23
High	109,791	53
Very High	42,307	20

D. Estimated Erosion Potential: 1.4 to 3.0 tons/year

Potential erosion was estimated using WEPPcloud, with focused analysis in the Coffee-Boulder, Callahan-Boulder, Taylor, SF Taylor, and Cronan-Big Creek watersheds. Larger volumes are estimated for Big Creek and SF Taylor (see Soil Resource Report).

E. Estimated Sediment Potential: 929 to 2,363 $yd^3/mi^2/yr$

Estimates derived from WEPPcloud eroded volumes as a function of sediment delivery ratio (SDR) that accounts for hillslope sediment travel distances and hillslope storage. Hillslope structure and roughness generally provides for 50% or less delivered sediment from eroded soil. Within the focused watersheds the SDR was adjusted to account for expected increased sediment delivery efficiency (see Soil Resource Report).

F. Estimated Vegetative Recovery Period (years):

3-5 years depending on elevation. Lower elevation sites would likely have a quicker recovery period compared to higher elevation 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.

G. Estimated Hydrologic Response (brief description):

Damaging Storms: Annual precipitation ranges between 43 to 69 inches, primarily arriving between November and April, although summer thundershowers do occur. The majority of the assessment area is within the rain-snow transition zone (3,500-6,500 feet). Snow accumulation versus rainfall affects the magnitude of post-fire watershed response, slowing runoff and favoring infiltration. It is important to note that rain-on- snow events are common within this elevation and have caused flooding even in unburned conditions (ex. 1964, 1997).

Although not the only types of storms that could occur, likely damaging storms within the burn area are: 1) short duration, high intensity storms which frequently trigger debris flows (ex. monsoonal thunderstorms); 2) warm, long duration storms related to atmospheric rivers; and 3) rain-on-snow events (also linked to atmospheric rivers). Short duration, high intensity storms will pose a localized risk to smaller catchments and nearby areas downstream. The longer duration and rain-on-snow storm events could cause flooding in the larger watersheds and higher order streams.

A 2-year RI rainfall intensity for the 12-hour interval occurred on October 21, 2021 during a series of small storms that occurred between October 21-25, 2021. Effects of the storms were recorded by the team in the post-storm assessment write-ups. The BAER team used the Q2 event to estimate post-fire watershed response as it is likely to occur within any given year. Field observations of storm damage on October 21 aligned with the initial estimates of watershed response for a 2-year RI event. Side catchments produced a range of nuisance sediment, sediment-laden flows, and debris flows, mobilizing woody debris and sediment to the mainstem channels, and in places, diverting down roads. Although some side drainages have eroded to

bedrock, bare slopes and undercut banks will continue to supply sediment in future runoff events. Sediment and woody debris that was transported to channels and deposited on floodplains, in pools, and on banks can be remobilized in subsequent storms. While a 2-year RI storm occurred, the risk of an equivalent or larger storm resulting from a rain-on-snow event is still likely to occur especially as the winter and spring progress.

Hydrologic Processes: Fire causes impacts to several hydrologic processes including reduction in interception, transpiration, and infiltration, and increased runoff (due to lack of litter and decreased surface roughness). Removal of vegetation and changes to soil such as increases in hydrophobicity, changes in soil structure, and removal of duff, organic matter, and roots alters these processes and ultimately lead to increases in runoff, peak flows and erosion. These alterations are typical of soils classified as having incurred moderate to high SBS. In areas with higher percentages of continuous high and moderate SBS, the lack of overstory and needle cast potential, and steep slopes will cause watershed response to be high in some catchments (Table 8). Increases in runoff and bulking of flows across the burn area at selected pour points are expected to be 140% to 210% compared to normal.

Table 8: Modeled pre- and post-fire flows at select pour points for the 2 yr peak flows using USGS Regional Regression Equations

			2 yr. RI Peak Flow			
PP#	**Modeled Pour Point**	**% of Mod & High SBS**	**Pre-Fire Q (CFS)**	**Post-Fire Q (CFS)**	**Post-Fire Bulked Q (CFS)**	**Bulked Q Compared to Pre-Fire Q (Times increase)**
PP1	Boulder Creek (Callahan area)	41%	734	1,261	1,469	2.0
PP2	Taylor Creek (outlet)	49%	1360	2,364	2,783	2.0
PP3	South Fork Salmon (Petersberg FS)	22%	5190	6,657	7,311	1.4
PP4	Hobo Gulch CG	21%	4590	5,939	6,519	1.4
PP5	Coffee Creek (fire boundary)	40%	8070	12,408	14,309	1.8
PP6	Boulder Creek (Coffee Creek watershed)	49%	1030	1,842	2,171	2.1
PP7	Big Creek (Cronin Fire)	51%	251	439	517	2.1

pourpointmap.png | Powered by Box

Channel crossings, floodplains, depositional fans, and low-lying areas have an inherent risk of flooding which will be exacerbated by the fire. Increased runoff and sediment delivery (ex. surface erosion, sediment-laden flows, and debris flows) can lead to channel migration and braiding across valley bottoms in flood events. Lateral channel migration can erode cut banks and undercut slopes, streamside trees, and banks. Aggradation can increase probability of channel migration and flooding by reducing channel capacity within banks. Dormant channels may be reactivated in post-fire runoff events. This makes prediction of hazardous flow paths within a floodplain and on alluvial fans difficult, resulting in a hazardous zone, versus point or line.

Watershed response will pose a very high risk to life, safety, and infrastructure. Watershed response in the Taylor Creek, Coffee Creek, and Boulder Creek watersheds will include substantial increases in runoff, mobilized sediment and woody debris. The combination of increased flows, sediment loads, and woody debris increase the volume of post-fire flows, which could negatively impact culverts, constructed channel ways, and other infrastructure designed to pass "normal" flows. It is important to note that downstream areas that experience regular flooding or difficulty controlling drainage during small storms will be very likely to experience flooding and/or failure in post-fire storms. Bulking and increased flows may cause channels to flood, divert, or migrate to areas that do not usually flood.

Watersheds and catchments with predominately unburned, very low, and low SBS will experience mild watershed response impacts. It is likely that water will have some ash, sediment, and floatable woody debris but peak flows will not be significantly increased outside the normal range of variability.

H. Estimated Debris Flow 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 within the River Complex in order as having the highest possibility of debris flow initiation: Lower Coffee Creek (Boulder Creek SHF), Upper Coffee Creek, Taylor Creek, Boulder Creek (KNF), N Fork Trinity River, and S Fork Salmon River. The recent storm produced initiations as predicted in Lower (Boulder Creek SHF) and Upper Coffee Creek, above average sedimentation in Boulder Creek (KNF), and noticeable recent deposition within Taylor Creek.

River_DebrisFlowProbability.jpg | Powered by Box and River_DebrisFlowCombinedHazard.jpg | Powered by Box

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The River Complex Fire is comprised of the Haypress, Summer and Cronan fires located on both the Klamath National Forest and the Shasta-Trinity National Forest. The incident started July 30, 2021 by multiple lightning fires. A series of late July thunderstorms created lighting strikes that, over a series of days, started several wildfires on the western side of Klamath National Forest in Siskiyou County, California. Early September, the Haypress and the Summer Fires merged into one large fire. The merged Haypress and Summer Fires quickly spread to the south and west onto the Shasta-Trinity National Forest in Trinity County, California. The Cronan remained a single fire.

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: BAER Critical Values | 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 atsmoshperic river) impacted Northern California during the BAER Assessment. The 10-day storm total for this event on the River Complex

was 10.26 inches per the Coffee Ridge Rain Gauge Data, which is located in the Coffee Creek drainage (vs on the ridge). 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 9: 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. **Very High to 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 SHF) and trails including the Pacific Crest National Scenic Trail (KNF and SHF) in high to moderate SBS in and downstream of the burn. Within and downstream of the burned area, locations of particular concern include: Coffee Creek, Boulder Creek (Coffee Creek drainage), and Little Boulder Creek (Coffee Creek drainage) (SHF-HS) and within and downstream of the burn area of Taylor Creek and Boulder Creek (Callahan Area) (KNF-HS). 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 SHF)
   b. **Very High** risk to human life/safety on NFS land from threats associated with hazard trees, falling into stump holes, and interacting with debris from burnt infrastructure and sewage contamination at Goldfield Campground. Hazardous material and raw sewage may be mobilized due to increased flooding of the site. Treatment recommendations include temporary closures and install warning signage, removal of smaller unsalvageable burnt debris, pumping and capping the CXT, and stabilization of areas that may contain hazardous material within these sites. This site will need to be assessed for hazard trees prior to reopening. (SHF only)
   c. **Very High** risk to the public exists due to unsafe burnt infrastructure and hazardous materials introduced to water sources in and downstream of the burn area due to chemicals leaching from one NFS burnt bridge (Poison Taylor Bridge). Recommended treatment is the removal of the remnants of the burnt bridge. (KNF only)
   d. **Very High** risk to human life/safety from accessing FS Road 37N19Y from county road 104 (Coffee Creek Rd), which was washed out by Boulder Creek . Treatment recommendations include installing a sign and constructing a physical closure until an inspection can be completed. (SHF only)
   e. **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 SHF)
   f. **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 fifteen trailheads, five campgrounds, and three river access sites as on the KNF and nineteen trailheads on the SHF 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 SHF)

g. **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 SHF).

h. **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.

i. **Intermediate to Low to Very 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 SHF) and trails (KNF and SHF) 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 SHF)

j. **Low to Very Low** risk to human life/safety of Forest employees and users at the Forest Service's Petersburg Fire Station. The Station was assessed for possible impacts due to flooding and its water system becoming compromised. The Fire Station is located out of the flood zone and it is unlikely that ash will make it into the covered spring box. No treatment recommended. (KNF only)

k. **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 SHF)

There may be an increased threat to private residences and private bridges, to several local, county and state roads, and to authorized permitted water systems within and adjacent to the fire perimeter. The potential for flash flooding, debris flows, falling rocks and trees poses a threat to human life/safety as well as loss of ingress and egress to landowners if road systems and bridges are impacted. Water quality for domestic water sources may be at an increased risk from increased sedimentation and burnt hazardous material becoming mobilized and entering the streams and or leaching into the ground water. Several private residences and bridges and local, county and state roads exist within and 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 SHF)

2. **Property (P):**a. **Very High to High** risk to 26.33 miles on the KNF and 9.95 miles on the SHF 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 SHF)

b. **Very High** risk to the public exists due to unsafe burnt infrastructure and hazardous materials introduced to water sources in and downstream of the burn area due to chemicals leaching from one NFS burnt bridge (Poison Taylor Bridge). Recommended treatment is administering a site-specific closure, removal of the remnants of the burnt bridge, and fill from the stream channel. Additionally, this site should be referred to the BAR program and assessed as part of long-term recovery efforts. (KNF only)

c. **Very High** risk to 45.26 miles on the KNF and 29.29 miles on the SHF 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 SHF)

d. **Very High** risk to 3.07 miles on the KNF and 6.53 miles on the SHF of NFS trail prisms and associated trail infrastructure for the Pacific Crest National Scenic Trail (PCT) within and downslope from hillslopes burned at a high to moderate severity 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 trail 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 and SHF)

e. **High** risk to stationary developed recreation site infrastructure from hazard trees at four sites on the KNF and 7 sites on the SHF 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 SHF)

f. **Intermediate to Low** risk to 81.47 miles on the KNF and 5.09 miles on the SHF of NFS roads (OP ML 2-5) and associated NFS road infrastructure (such as bridges and culverts) in low SBS severity "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 SHF)

g. **Intermediate** risk to 47.34 miles on the KNF and 47.99 miles on the SHF of NFS trail prisms and associated trail infrastructure within and downslope from hillslopes burned at a low severity 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 SHF)

There may be an increased threat to private property and private bridges, to local, county, and state roads, and to authorized permitted water systems within and adjacent to the fire perimeter. The potential for flash flooding, debris flows, falling rocks and trees poses a threat to this property as well as loss of ingress and egress to landowners if road systems and bridges are impacted. Several private residences and bridges and local, county and state roads exist within and 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 SHF)

3. **Natural Resources (NR):**a. **High and Intermediate** risk to hydrologic function from loss of ground cover and coarse woody debris, mass erosion, flooding and debris flows that scour channels below the root structure of the surviving plant communities. Approximately 37% of the fire burned at high to moderate SBS, the threat to hydrologic function exists to varying degrees in all subwatersheds with a significant increase in high to moderate SBS. Locations of particular concern within and downstream of the burned area include: Coffee Creek, Boulder Creek (Coffee Creek drainage), and Little Boulder Creek (Coffee Creek drainage) (SHF-HS); and Taylor Creek and Boulder Creek (Callahan Area) (KNF- HS). Treatment recommended is natural recovery. Impacts to hydrologic functions will benefit from the proposed roads, trails, and land treatments. (KNF and SHF)

   b. **High** risk to water quality from hazardous materials mobilizing and leaching into the domestic water supply. Areas of concern include NFS lands at Goldfield Campground (SHF–HS) and the Taylor Creek Drainage having one burnt bridge (KNF–HS) located near the channel. Sewage contamination could impact domestic water supply within the burn area from the flooding and overwhelming of an open pit vault toilet at Goldfield Campground. Treatments recommended include removal of burnt bridge material out of the channel (KNF only) and pump one open pit vault toilet (SHF only).

   c. **High** risk to water quality 303d listed streams from the increase in sediment delivery to the channels and loss of canopy cover which could impact water temperature. Treatment recommended is natural recovery. However; other proposed treatments will result in benefits to this value. (KNF and SHF)

   d. **High to 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 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. These combined impacts may lead to a long-term loss or reduction of suitable stream habitat for Coho salmon, Spring Chinook salmon, and other native fish. For all fish species, there is a concern that until enough vegetative recovery has occurred habitat degradation will continue. Of particular concern are five drainages in the Cronan Fire. The specific habitat component of concern is thermal refugia located at creek mouths which provide a cool-water oasis when summer water temperatures of NF Salmon River are elevated. If access to thermal refugia areas is blocked by post-fire mobilized granitic sands when juvenile fish have need for their use, the result would be detrimental. Elsewhere in the fire area, site-specific concerns associated with roads in higher SBS locations could result in downslope or downstream impacts to aquatic habitat. Of note, the Road 38N07 bridge over Taylor Creek is at risk for failure; and although it ranks intermediate risk in regard to T&E habitat, it has been identified as high risk in regard to life/safety and very high risk for Forest

Service property loss. Treatment recommended for areas with high risk to T&E species is to hand-remove material (KNF–C). Specific fisheries treatments to reduce potential impacts to habitat will rely on the road stabilization treatment. (KNF and SHF) For areas with intermediate to low risk to T&E species, no treatment is justified.

e. **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 SHF)

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. WEPPcloud was used to predict postfire erosion, with low soil erosion estimates attributed to roughly 66% of the fire area mapped as unburned-very low and low SBS. 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 SHF).

g. **Low** risk to water quality ORV impacts to the North and South Fork Salmon Rivers, the North Fork Trinity River and the Klamath River, which are designated wild and scenic rivers. Because risk is low, no treatment is justified. However; other proposed treatments will result in benefits to this value. (KNF)

Several private residences and associated outbuildings were lost in the River Complex. Risk to water quality from hazardous materials mobilizing and or leaching into the domestic water supply are a concern. Coordination and information sharing with landowners, Karuk Tribe, NRCS, CalTrans, NWS, USGS, and other emergency services is recommended. (KNF and SHF)

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). The fire has exposed numerous recorded cultural sites. Treatment Recommendations are 1): Sign Installation at three FS trailheads that provide access to three cultural resources (CR-R2, CR-R3, CR-R4). These signs serve to notify the public of Antiquities Act of 1906 prohibitions against looting and vandalism. BAER funds are requested to treat these risks. 2): A lop-and-scatter treatment is prescribed for CR-R1. Nearby brush and woody

debris would be used to help conceal the newly exposed features within the site to protect them from unauthorized collection, looting or vandalism. Cultural resources will benefit from the proposed road and trail stabilization treatments. (KNF and SHF)

b. **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 Cronan Fire area. No other sites or areas were assessed for this BAER VAR. Because risk is low, no treatment is justified. However; other proposed treatments will result in benefits to this value. (KNF)

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 River Complex.
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 River Complex.
c. Protect or mitigate potential post-fire impacts to critical natural resources within the burned area. Implement treatments that minimize threats to water quality for municipal and domestic water supplies from the leaching and mobilization of hazardous material associated with burnt infrastructure currently located in the channel.
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 River Complex.
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 River Complex.
f. Reduce impacts to water quality that are designated as impaired water bodies for the River Complex.
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 River Complex.

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

Land: 50%
Channel: 75%
Roads/Trails: 50%
Protection/Safety: 85%

D. Probability of Treatment Success

Table 10: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land	75	85	95
Channel	75	85	95
Roads/Trails	75	85	95
Protection/Safety	80	70*	60*

	1 year after treatment	3 years after treatment	5 years after treatment
	*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):

River Complex - KNF - $6,954,160 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. $6,258,744 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_RiverKNF.pdf | Powered by Box

River Complex - SHF - $7,294,315 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. $6,564,884 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_RiverSHF.pdf | Powered by Box

F. Cost of Selected Alternative (Including Loss):

River Complex - KNF - $6,954,160 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. $6,258,744 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 $303,577.00. 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 $2,781,664. 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 River Complex – KNF portion is 9.2. The implied minimum value of protecting non-market resource values is justified. Analysis found here: River-McCash_VAR_CB_Worksheet_20211029_RiverKNF.pdf | Powered by Box

River Complex - SHF - $7,294,315 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. $6,564,884 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. 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 $211,963.00. 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 $2,917,726 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 River Complex – SHF portion is 13.8. The implied minimum value of protecting non-market resource values is justified. Analysis found here: River-McCash_VAR_CB_Worksheet_20211029_RiverSHF.pdf | Powered by Box

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

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

Team Members: *Table 11: 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 (t)
GIS	Marilyn Porter, Daniel Reinkensmeyer (t)
Archaeology	Jacob Batisky, Robin Hopkins, Michael Kellett
Weeds/Botany	Erin Lonergan
Recreation	Erik Rademacher, Karl Dietzler
Fish	Maija Meneks (t)
Logistics	Diane Cross
Information	Cathleen Thompson

Treatment Map found here:

H. Treatment Narrative:

Land Treatments:

Early Detection and Rapid Response Treatments along Suppression Features and within General Burn Areas:

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 SBS and proximity to known infestations and sensitive resources such as the Marbles Mountain Wilderness, Trinity Alps Wilderness, Botanical Special Interest Areas, sensitive native plant communities, and recreation sites.

Early Detection Rapid Response (EDRR) for threats related to suppression disturbances (KNF and SHF).
Klamath (KNF) Detection surveys are proposed along 56 miles of dozer line, 13 miles of handline, 40.6 miles of road improved as line, and at 2 drop points. Treatment at two known infestations that are collaboratively managed by the forest and local partner groups is proposed to protect long-term Forest Service and community investments in these locations. Proposed sites include ISTI-96, an infestation of dyers woad in the Cronan fire area that was disturbed by dozer activity, and ISTI-32, an infestation of dyers woad in the Haypress-Summer fire area and was impacted by considerable suppression actions.

Shasta Trinity (SHF) Detection surveys are proposed along 16 miles of dozer line, 17.5 miles of handline, 19 miles of road improved as line, and 4 drop points.

Table 12: Initial Cost Estimate for suppression related EDRR treatments on the Klamath National Forest. Cost breakdown is based on estimated prices for accomplishing work with the assistance of the Salmon River Restoration Council (SRRC), a local watershed group that is best situated to conduct treatments.

ITEM	UOM	UNIT COST	# OF UNIT	TOTAL COST
SRRC RESTORATION DIRECTION	Day	$531	3	$1,593
SRRC PROGRAM MANAGER	Day	$384	5	$1,920
SRRC PROJECT MANAGER	Day	$321	40	$12,840
SRRC FIELD TECHS (3)	Day	$780	33	$25,740
PER DEIM (4 PEOPLE)	Day	$140	35	$4,900
SUPPLIES	Lump Sum	$240	1	$240
VEHICLE AND FUEL	Week	$600	12	$7,200
TOTAL				**$54,433**

Table 13: Initial Cost Estimate for suppression related EDRR treatments on the Shasta-Trinty National Forest. Cost breakdown is based on estimated prices for accomplishing work with the assistance of Americorps crews. Prices are slightly elevated to account for potential need to use contract labor to accomplish work. Local watershed groups do not have the capacity to conduct this work.

ITEM	UOM	UNIT COST	# OF UNIT	TOTAL COST
FIELD TECHNICIANS (4)	Day	$800	30	$24,000
CREW LEAD	Day	$300	30	$9,000
PER DIEM (5 PEOPLE)	Day	$150	30	$4,500
ZONE BOTANIST 0T	Day	$550	8	$4,400
SUPPLIES	Lump Sum	$110	1	$110
VEHICLE AND FUEL	Week	$600	6	$3,600
TOTAL				**$45,610**

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

Klamath (KNF) Detection surveys are proposed along 1 mile of trail from the East Boulder trailhead. This trail burned at high severity and has known infestations nearby. Other nearby trails had handline constructed along them and thus are included under proposed suppression surveys.

Shasta Trinity (SHF) Detection surveys are proposed along 4 miles of trail, specifically along 1-mile segments of the North Fork Coffee Creek, East Fork Coffee Creek, Sugar Pine, and Boulder Creek trailheads. Treatment of 8 actively managed infestations in the Coffee creek area is proposed. This is a high-use recreation area making continued treatment at these sites a high priority for protecting native plant communities of the surrounding area.

Table 14: Initial Cost Estimate for burn related EDRR treatments on the Klamath National Forest. Cost breakdown is based on estimated prices for accomplishing work with the assistance of the Salmon River Restoration Council (SRRC), a local watershed group that is best situated to conduct treatments.

ITEM	UOM	UNIT COST	# OF UNIT	TOTAL COST
SRRC RESTORATION DIRECTION	Day	$531	1	$531
SRRC PROGRAM MANAGER	Day	$384	1	$384
SRRC PROJECT MANAGER	Day	$321	5	$1,605
SRRC FIELD TECHS (3)	Day	$780	5	$3,900
PER DEIM (4 PEOPLE)	Day	$140	5	$700
VEHICLE AND FUEL	Week	$600	1	$600
TOTAL				**$7,720**

Table 15: Initial Cost Estimate for burn related EDRR treatments on the Shasta Trinity National Forest. Cost breakdown is based on estimated prices for accomplishing work with the assistance of Americorps crews. Prices are slightly elevated to account for potential need to use contract labor to accomplish work. Local watershed groups do not have the capacity to conduct this work.

ITEM	UOM	UNIT COST	# OF UNIT	TOTAL COST
FIELD TECHNICIANS (4)	Day	$800	10	$8,000
CREW LEAD	Day	$300	10	$3,000
PER DIEM (5 PEOPLE)	Day	$150	10	$1,500
ZONE BOTANIST 0T	Day	$550	2	$1,100
VEHICLE AND FUEL	Week	$600	2	$1,200
TOTAL				**$14,800**

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

CR-R1 (KNF) : *Lop-and-scatter:* On the Klamath NF, one Cultural Resource site was identified as needing an emergency treatment to prevent the looting of artifacts. The identified site is an important component of a major historic mining district. Hundreds of artifacts that were previously covered by brush are now visible to a major road where looters have been known to search for artifacts. Lop-and-scatter is recommended for this site. Local brush and woody debris will be used to disguise the exposed features as well as to promote vegetation recovery. This work will require either overtime for a local forestry crew of two or contractors. The work would also be supervised by Heritage staff to help direct placement of brush and to document the activity on the site. Effectiveness monitoring of the lop-and-scatter treatment 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 – Lop-and-scatter (KNF - C) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
FORESTRY TECHNICIAN*	Each	$172	2	$344
ARCHAEOLOGIST*	Each	$278	1	$278
TOTAL				**$622**

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

CR-R2 (SHF): *Sign Installation:* On the Shasta-Trinity NF, one Cultural Resource site was identified as needing an emergency treatment. The treatment recommended is the placement of a "Notice" at the trailhead that leads to the site. This site has burned before and there is evidence that looting has taken place after those burns. Further looting of the site would lead to irreversible data loss. The posting of the sign would be conducted by a Recreation Technician. An Archaeology Technician would also be present to direct placement and document the activity. Effectiveness monitoring of the notice sign 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 17: Initial Cultural Stabilization – Advisory Signs (SHF - HS) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TRAILHEAD SIGN	Each	$20	1	$20
RECREATION TECHNICIAN*	Each	$213	1	$213
ARCHAEOLOGICAL TECHNICIAN*	Each	$213	1	$213
TOTAL				**$446**

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

CR-R3 & CR-R4 (KNF): *Sign Installation:* On the Klamath NF, two Cultural Resource sites were recognized as needing emergency treatments. The treatment being recommended is the placement of a "Notice". Two trailheads are identified as potential access to the sites and the cultural resources' locations in high/moderate soil-burn-severity makes them highly susceptible to looting. There is the potential for irreversible data loss if artifacts are taken from the site. Similar to the treatment for CR-R2, the hanging of the sign would be conducted by a Recreation Technician or contractor. 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 18: Initial Cultural Stabilization – Advisory Signs (KNF - HS) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TRAILHEAD SIGN	Each	$20	2	$40
RECREATION TECHNICIAN*	Each	$235	1	$235
ARCHAEOLOGICAL TECHNICIAN*	Each	$235	1	$235
TOTAL				**$510**

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

Channel Treatments:

T&E Aquatic Treatment (KNF only) - Thermal Refugia Access – Cronan Fire:

Thermal Refugia within streams is important for certain aquatic life, including endangered fish species such as designated Coho Critical Habitat and spring-run Chinook habitat found in the River Complex on the Cronan Fire. Thermal refugia is particularly important in watersheds that have less than optimum shade conditions because of historical and current land use impacts such as wildfires. The assessed five (5) known natural thermal refugias associated with Yellowjacket Ridge tributaries to the North Fork of the Salmon River – i.e., Big Creek, Boulder Gulch, Cronan Gulch, Kanaka Gulch, and Olsen Creek, are locations where juvenile Coho and Chinook have been observed using refugia. The fish (congregating in these area) survival with high surface temperatures is dependent on their access to cold-water discharges. Increased post-storm erosion is anticipated across the Cronan Fire and will adversely impact the tributaries' ability to input cold-water discharges into the five known areas of natural refugias along the North Fork of the Salmon River. Removal of this material by hand will allow for continued cold thermal input and is the recommended treatment. It should occur immediately following storm events at the mouth of each of the five listed drainages and should occur in

late-spring or early-summer, after run-off has concluded, but before the river has heated enough to require juvenile fish to use thermal refugia.

Table 19: Initial T&E Aquatic Treatment (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
THERMAL REFUGIA ACCESS	Day	$800	5	$4,000
TOTAL				**$4,000**

**Expectation is to use a local partner (Salmon River Restoration Council) via an existing agreement; cost estimate from partner.*

Roads and Trail Treatments:

Road Stabilization (KNF and STF):

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 High/Moderate SBS areas were prioritized for both inspection and treatment. Road mileage data from these roads are 26.33 miles for the Klamath NF and 9.95 miles for the Shasta-Trinity NF. Because of time constraints, road conditions, and hazards present during the inspection phase, visual inspection of roads was limited to an estimated 8.77 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 high to moderate SBS. Initial treatments include culvert cleaning; ditch cleaning; template reshaping to provide positive drainage to ditches and culverts.

Brief objectives and description of the road stabilization treatments are as follows:

1) 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

Table 20: Initial Road Stabilization (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
RESTORE DRAINAGE	Mile	$4,222	26	$109,772
EQUIPMENT RENTAL	Week	$3,000	3	$9,000
TOTAL				**$118,772**

**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 21: Initial Road Stabilization (SHF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
RESTORE DRAINAGE	Mile	$2,331	10	$23,310
EQUIPMENT RENTAL	Week	$3,000	2	$6,000
TOTAL				**$29,310**

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

Trail Stabilization (KNF and STF)

There are 23.28 miles of trail on the KNF and 37.81 miles of trail on the STF on slopes greater than 20% in moderate and high SBS that 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 $6,200,000 Forest Service investment combined. 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. Due to the remote location of most of these trail segments, mileage 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 22: Initial Trail Stabilization (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-07 TRAILS TECH	Day	$250	25	$6,250
CONTRACT CREW X 4	Day	$1,200	25	$30,000
PER DIEM	Day	$42	25	$1,050
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	25	$691
PACKSTOCK SUPPORT	Day	$1,500	6	$9,000
TOTAL				**$46,991**

**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 23: Initial Trail Stabilization (SHF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-07 TRAILS TECH	Day	$250	40	$10,000
CONTRACT CREW X 4	Day	$1,200	40	$48,000
PER DIEM	Day	$42	40	$1,680
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	40	$1,105
PACKSTOCK SUPPORT	Day	$1,500	10	$15,000
TOTAL				**$75,785**

**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 (KNF and STF)

There are 3.11 miles of the Pacific Crest National Scenic Trail (PCT) running through the fire perimeter on the KNF, and 6.49 miles of the PCT on the STF. 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. 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. All 9.6 miles of the PCT on both forests is prioritized, because the probability of damage or loss is likely, and the expected increase in post-fire runoff and erosion will lead to trail failure and loss. The magnitude of consequences is moderate (even in lower SBS classes). Because of the national designation status, plus different trail construction standards for the PCT (specifically gradient and width design standards), the trail represents an approximate $1,000,000 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-07 TRAILS TECH	Day	$250	4	$1,000
CONTRACT CREW	Day	$1,200	4	$4,800
PER DIEM	Day	$42	4	$168
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	4	$111
PACK SUPPORT	Day	$1,500	2	$3,000
TOTAL				**$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 - PCT (SHF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-07 TRAILS TECH	Day	$250	7	$1,750
CONTRACT CREW	Day	$1,200	7	$8,400
PER DIEM	Day	$42	7	$294
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	7	$193
PACK SUPPORT	Day	$1,500	2	$3,000
TOTAL				**$13,637**

**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 26: Initial Protection and Safety - Roads (KNF) Cost Estimate.

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
BURN HOLE REPAIR	Each	1000.00	40	$40,000
TOTAL				**$40,000**

**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 27: Initial Protection and Safety - Roads (SHF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
BURN HOLE REPAIR	Each	1000.00	18	$18,000
TOTAL				**$18,000**

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

Warning Signs – Roads (KNF and STF)

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 28: Initial Warning Signs – Roads (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
ROAD WARNING SIGNS	Each	$350	10	$3,500
TOTAL				**$3,500**

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

Table 29: Initial Warning Signs – Roads (SHF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
ROAD WARNING SIGNS	Each	$350	5	$1,750
TOTAL				**$1,750**

**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 – Trails (KNF and STF)

On KNF lands, there are 15 trailheads, 5 campgrounds, and 3 river access sites within or directly accessing burned areas. For the STF, there are 19 trailheads. There is a human health and safety risk to visitors using these recreation sites due to post-fire impacts, including flooding, rolling rocks, hazard trees, burned out stump holes, and debris flows in the area. 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 campgrounds and trailheads within (or with trails leading to and within the fire perimeter), and at river access sites with the potential for visitors and boaters to experience flooding and fire-generated debris.

Table 30: Initial Warning Signs – Trails (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TRAIL, CAMPSITE, AND RIVER ACCESS WARNING SIGNS	Each	$15	23	$345
POST AND MISC HARDWARE	Each	$20	23	$460
GS-7 FORESTRY TECH	Day	$250	6	$1,500
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	6	$166
TOTAL				**$2,471**

**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 31: Initial Warning Signs – Trails (SHF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TRAIL WARNING SIGNS	Each	$15	19	$285
POST AND MISC HARDWARE	Each	$20	19	$380

GS-7 FORESTRY TECH	Day	$250	6	$1,500
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	6	$166
TOTALS				**$2,331**

**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 STF)

There is an immediate threat to infrastructure at four trailheads on the KNF (China Gulch, Carter Summit, Fox Cr. Ridge and Middle Boulder Trailheads), and seven trailheads (Boulder Cr., Boulder Lake, Union Creek, S. Fork Coffee Creek, Lady Gulch, Adams Lake and Packers Peak) on the STF within the fire perimeter in high to moderate SBS. 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 mostly receive a high 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 32: Initial Recreation Site Protection and Stabilization (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-9 FORESTRY TECH FOR HAZ TREE ID	Day	$300	2	$600
FALLING TEAM	Day	$1,200	2	$2,400
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	2	$55
TOTAL				**$3,055**

**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 33: Initial Recreation Site Protection and Stabilization (SHF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
GS-9 FORESTRY TECH FOR HAZ TREE ID	Day	$300	2	$600
FALLING TEAM	Day	$1,200	3	$3,600
FLEET VEHICLE DAY & MILEAGE	Day	$27.63	2	$55
TOTAL				**$4,255**

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

Administrative Site-Specific Closure, Installation of Warning Signs, Hazardous Material Removal and Site Stabilization – Goldfield CG (STF only)

The BAER team identified one significant potential threat to the public and agency personnel that is located in the Coffee Creek area where the risk of flooding and debris flows is high. The Goldfield Campground burned entirely, with a loss of sanitation facilities and a risk of hazard tree strikes, possible flooding, and debris flows. The treatment is designed to protect visitors from injury or death from hazard trees, flooding, and debris flows, burned infrastructure and a now open toilet vault. Additionally, to prevent burned toilet waste from release into the environment and waterbodies there is a need to contain materials onsite until final cleanup and disposal can occur. A site-specific administrative closure is being recommended for the site along with the install of closure signage. Install containment materials around burned site (fiber or wood mulch wattles) and reduce aerial migration with chipped material (burned wood on site). The installation materials will consist of staked fiber or wood mulch wattles placed below and downslope of flow pathways of burned site to contain ash and refuse on site. All work will be completed outside of the burned materials (just downslope) so crews do not contact hazardous refuse. Pump and remove waste inside exposed vault. Cap vault with wood or other

material. Remove unsafe burnt infrastructure from the area and properly disposed of off of Forest Service property.

Table 34: Initial Recreation Site Protection and Stabilization (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
MATERIALS	Each	$850	1	$850
GS 7 CREW (2 PEOPLE)	Day	2	$550	$1,100
GS-9 CREW LEAD (1 PERSON)	Day	2	$350	$700
VEHICLE MILEAGE (2 VEHICLES AND CHIPPER)	Mile	400	$0.75	$300
PUMP TANK	Lump Sum	1	$1,000	$1,500
CONTINGENCY / DUMP FEES	Lump sum	1	$550	$550
TOTALS				**$5,000**

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

Hazardous Material Removal – Road Bridge (KNF only):

The Poison Taylor Bridge is a creosote-treated, wood bridge that suffered significant fire damage. Creosote is a mixture of hundreds of chemicals and is the most common product utilized to preserve wood in United States. Creosote can be released into soil and water and can adversely impacting water quality. Water bodies in this drainage are 303d listed impaired (prefire) and may support localized domestic and agricultural use. The Bridge abutment on the south end was damaged by the fire and is at risk of collapsing into the stream channel. To eliminate this risk the bridge should be removed before it collapses, and the treated bridge material removed from the area and properly disposed of off of Forest Service property.

Table 35: Initial Hazardous Material Removal – Road Bridge (KNF) Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
BRIDGE REMOVAL	1	$7500	1	$7,500
MATERIAL DISPOSAL	1	$2500	1	$2,500
TOTAL				**$10,000**

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

Storm Inspection Roads (KNF and SHF):

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 High/Moderate SBS areas was prioritized for both inspection and treatment. Road mileage data from these roads are 26.33 miles for the Klamath NF and 9.95 miles for the Shasta-Trinity 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.

See Engineering Report for a complete list of roads to be visited for storm patrols.

Table 36: Initial Storm Inspection & Storm Response 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	4.39	$2,415
TOTAL				**$2,415**

**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 37: Initial Storm Inspection & Storm Response Roads (SHF) 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	$1,100
TOTAL				**$1,100**

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

Tribal Monitoring/Consultation (KNF only):

There is an MOU (memorandum of understanding) between the Karuk Tribe and the Klamath National Forest for conducting Government to Government Consultation. Karuk Tribe's active involvement with the Forest 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 Cronan Fire area. Continued support and coordination with the Designated Tribal Government Representative is recommended prior to project implementation in the Cronan Fire area.

Table 38: Initial Tribal Monitoring and Consultation (KNF only)

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 SHF):

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	days	1,361	40	$54,433	$0		$0		$0	$54,433
EDRR - H/M Burn Area	miles	1	7720	$7,720	$0		$0		$0	$7,720
Cultural	each	377	3	$1,132	$0		$0		$0	$1,132
Subtotal Land Treatments				$63,285	$0		$0		$0	$63,285
B. Channel Treatments										
T&E Aquatic	5	800	5	$4,000	$0		$0		$0	$4,000
Subtotal Channel Treatments				$4,000	$0		$0		$0	$4,000
C. Road and Trails										
Road Stabilization	miles	4,568	26	$118,772	$0		$0		$0	$118,772
Trails Stabilization	miles	2,019	23	$46,991	$0		$0		$0	$46,991
Trails Stabilization - PCT	miles	2,919	3	$9,079	$0		$0		$0	$9,079
Subtotal Road and Trails				$174,842	$0		$0		$0	$174,842
D. Protection/Safety										
Protection&Safety-Roads	each	40	1000	$40,000	$0		$0		$0	$40,000
Warning Signs - Roads	each	10	350	$3,500	$0		$0		$0	$3,500
Warning Signs - Trails	each	20	123.55	$2,471	$0		$0		$0	$2,471
Protection&Safety-Rec Sit	each	4	763.75	$3,055	$0		$0		$0	$3,055
Bridge Removal	each	1	10000	$10,000	$0		$0		$0	$10,000
Storm Partol	miles	4	550.114	$2,415	$0		$0		$0	$2,415
Tribal	days	2	550	$1,100	$0		$0		$0	$1,100
Interagency Coordination	days	10	0	$0	$0		$0		$0	
Subtotal Protection/Safety				$62,541	$0		$0		$0	$61,441
E. BAER Evaluation										
Initial Assessment	Report	1		$144,853	$0		$0		$0	$0
Subtotal Evaluation				-	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				**$304,668**	$0		**$0**		**$0**	**$303,568**
Previously approved				$0						
Total for this request				**$304,668**						

PART VII - KLAMATH NF APPROVALS

1. Rachel Smith Digitally signed by Rachel Smith Date: 2021.11.04 11:35:33 -07'00' 11/4/2021

Forest Supervisor Date

PART VI – SHASTA-TRINITY 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	days	1,520	30	$45,610	$0		$0		$0	$45,610
EDRR - H/M Burn Area	miles	4	3700	$14,800	$0		$0		$0	$14,800
Cultural	each	446	1	$446	$0		$0		$0	$446
Subtotal Land Treatments				$60,856	$0		$0		$0	$60,856
B. Channel Treatments										
				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
Road Stabilization	miles	2,946	10	$29,310	$0		$0		$0	$29,310
Trails Stabilization	miles	2,004	38	$75,785	$0		$0		$0	$75,785
Trails Stabilization - PCT	miles	2,101	6	$13,637	$0		$0		$0	$13,637
Subtotal Road and Trails				$118,732	$0		$0		$0	$118,732
D. Protection/Safety										
Protection&Safety-Roads	each	18	1000	$18,000	$0		$0		$0	$18,000
Warning Signs - Roads	each	3	583.333	$1,750	$0		$0		$0	$1,750
Warning Signs - Trails	each	19	122.684	$2,331	$0		$0		$0	$2,331
Protection&Safety-Rec Sit	each	7	607.857	$4,255	$0		$0		$0	$4,255
Goldfield GC	each	1	5000	$5,000	$0		$0		$0	$5,000
Storm Partol	miles	2	550	$1,100	$0		$0		$0	$1,100
Subtotal Protection/Safety				$32,436	$0		$0		$0	$32,436
E. BAER Evaluation										
Initial Assessment	Report	1		$144,853	$0		$0		$0	$0
Subtotal Evaluation				-	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				**$212,024**	$0		**$0**		**$0**	**$212,024**
Previously approved				$0						
Total for this request				**$212,024**						

PART VII – SHASTA-TRINITY NF APPROVALS

1. Digitally signed by RACHEL BIRKEY
Date: 2021.11.04 12:56:38 -07'00' 11/04/2021

Forest Supervisor Date