

Date of Report: October 4th, 2022

BARNES FIRE BURNED AREA REPORT



Barnes Fire off Hwy 395 showing origin near Barnes creek

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:** BARNES**B. Fire Number:** CA-MDF-006200**C. State:** CA**D. County:** Modoc**E. Region:** 05**F. Forest:** 05 - Modoc National Forest**G. District:** Warner Mt**H. Fire Incident Job Code:** P5P1ZT (0509)**I. Date Fire Started:** September 7th, 2022**J. Date Fire Contained:** 100% (As of 9/28/2022)**K. Suppression Cost:** \$10 million**L. Fire Suppression Damages Repaired with Suppression Funds (estimates):***Table 1: Fire Suppression Damages*

		Repair Status
Feature Category	Total	Completed - Inspected
Completed Dozer Line	31.4	15
Completed Hand Line	10.4	

M. Watershed Numbers:

HUC14 Drainages within the Barnes Fire burn perimeter, acres burned at different soil burn severities, and percent moderate and high SBS.

Table 2: Watershed Numbers

HUC 14 Names	Total Acres	Acres Burned	% Watershed Burned	Unburned	Low SBS	Moderate SBS	High SBS	% Moderate & High SBS
Buck Creek	1,800	783	44%	1017 (56%)	309 (17%)	372 (21%)	102 (6%)	27%
Mason Creek	230	230	98%	10 (2%)	136 (60%)	67 (30%)	19 (8%)	38%
Venning Creek	1,043	489	47%	554 (53%)	126 (13%)	233 (22%)	130 (12%)	34%

N. Total Acres Burned:*Table 3: Total Acres Burned by Ownership*

OWNERSHIP	ACRES
NFS	4564
PRIVATE	1223
BLM	56
TOTAL	5,843

O. Vegetation Types:

The Barnes fire burned through native vegetative communities of Eastside pine with Ponderosa pine, Jeffrey pine, incense cedar, greenleaf manzanita, mahala mat, big sagebrush, bitterbrush and Idaho fescue. Oregon white oak series with sugar pine, California black oak, buck brush, skunk bush and squirrel tail. Western juniper series with big sagebrush, birchleaf mountain mahogany and bitterbrush. Montane chaparral consisting of greenleaf manzanita, deer brush and rock spiraea.

P. Dominant Soils:

Soils developed on southeast facing slope composed of volcanic and volcanoclastic parent material. Soils are primarily clay loams with some families such as Anatone and Pass canyon developing shallow rocky textures on slope tops, shoulders, and in Quaternary lava flows. Higher elevations are dominated by mixed White Pine, White Fir and Lodgepole forests. Forest composition transitions to White Fir, Incense Cedar, and Ponderosa / Jeffery Pine Forest followed by Ponderosa and Western Juniper as elevation decreases.

Q. Geologic Types:

Tertiary volcanics including basalt lava flows, andesitic pyroclastics and intercalated andesitic lava flows, rhyolite and other volcanics (e.g. obsidian). The east-facing slopes of the Warner mountains also contain late Eocene to early Oligocene (34-41 Ma) volcanoclastic alluvial sandstone and conglomeratic sequence overlain by a series of overlapping volcanic edifices that record Oligocene and younger arc volcanism. The Oligocene sedimentary rocks include thin layers of siltstone and sandstone, but mostly they are rounded cobble conglomerate.

Debris Flow Potential:

There is a moderate potential for the occurrence of earth flows/debris flows within the burned area. Most of the streams and stream segments at risk for earth flows that will have moderate impact on values at risk. Values that are at risk include channel crossing along multiple road segments. Flow consistency will mostly be earth flows, but debris flows are possible.

Miles of Stream Channels by Order or Class:

Table 4: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	4.1
INTERMITTENT	7.0
EPHEMERAL	6.5
OTHER (DEFINE)	0

R. Transportation System:

Trails: National Forest (miles): 0

Other (miles):

Roads: National Forest (miles): 27.6

Other (miles):

PART III - WATERSHED CONDITION**A. Burn Severity (acres):**

Table 5: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	Other Federal BIA	State	Private	Total	% within the Fire Perimeter
Unburned	233	1	0	102	336	5
Low	1616	23	0	811	2451	42
Moderate	2178	29	0	304	2511	43
High	572	0	0	6	578	10
Total	4564	56	0	1223	5843	100

B. Water-Repellent Soil (acres): hydro/soils

Water repellency will increase on approximately 2,400 acres. Water repellency is a primary element of the soil effects in this fire: severe repellency is widespread and mostly continuous throughout the fire area, occurring in

all soil burn severity classes from the bottom of the surface-charred layer (generally 1-2 inches deep), and varying in thickness from ½ -2 inches in low SBS to 4-6 inches in high SBS. Repellency will be largely responsible for moderate soil burn severity expected to have a watershed runoff response similar to high. Repellency also occurred naturally in unburned areas, usually beginning at about 4 inches depth and 1-2 inches thick; repellency was greatly exacerbated by the fire in these coarse-sandy soils. Without repellency, these soils have rapid infiltration rates and surface runoff and erosion would normally be localized to shallow soil areas and/or steep slopes. It is estimated that about 40% of the fire area has water repellency elevated by the fire.

C. Soil Erosion Hazard Rating (SEHR):

Table 6: Erosion Hazard Rating

Barnes Erosion Hazard		
Erosion Hazard Rating	Acres	Percent
Low	3200	55%
Moderate	1335	23%
High	958	16%
Very High	350	6%
Total	5,843	100%

D. Erosion Potential: Total fire area: 0.92 tons per acre for a 5-year runoff event and 2.21 tons per acre on a 10-yr storm, as determined using ERMiT. Stated model accuracy is +/- 50%. With water repellency levels in this fire, +50% may be more representative for this area.

E. Sediment Potential:

Table 7: Sediment Potential

Barnes Fire Sedimentation Rates for 2, 5, 10-yr Storm						
2YR: Tons/Acre		2YR: Sediment Rates (tons)	5YR: Tons/Acre	5YR: Sediment Rates (tons)	10YR: Tons/Acre	10YR: Sediment Rates (tons)
Total	0.28	1,508	0.92	10,207	2.21	29,329

F. Estimated Vegetative Recovery Period (years): Due to the low – moderate burn severity of the Barnes fire, vegetative recovery for herbaceous and hardwood species is anticipated to occur within 3 years. High severity pockets of the fire may take up to 5 years, particularly if erosional storms wash away soil seed banks.

G. Estimated Hydrologic Response (brief description):

Annual precipitation: Ranges between 21 to 45 inches, primarily arriving between December and April, with thunderstorms intermittently occurring throughout the remainder of the year. The entire fire is within the winter snow accumulation area (5,000+ ft), which is the primary source of precipitation within the Fandango Pass. Rain-on-snow events are occurring with increasing frequency in this valley and can result in significant damage. Seasonal snow accumulations melt and reaccumulate numerous times throughout the winter period. Snow accumulation versus rainfall effects the magnitude of post-fire watershed response, slowing runoff and favoring infiltration. Topography within the Barnes Fire area is mountain valley formation where elevations within the assessment area change quickly over short distances. The area primarily contains steep and rocky slopes in the north which gradually turn into rolling hills and valley meadows as the perimeter terminates in the south. The highest peak in the fire is Fandango Peak at 7,791 feet while Fandango Valley sits in the base around 5,000 ft.

Damaging Storms: 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.

Hydrologic Processes:

Table 8: Modeled pre- and post-fire flows at select pour points for the 2-yr peak flows.

HUC 14 Drainage	PP#	Modeled Pour Point	% of Mod & High SBS	2 yr. RI Peak Flow			Flood Hazard Rating
				Pre-Fire Q (CFS)	Post-Fire Q (CFS)	Post-Fire Q Compared to Pre-Fire Q (Volume/Sec)	
Buck Creek-Willow Creek	PP1	Buck Creek, culvert road crossing at Buck Creek fire station	27%	22	31	1.4	MODERATE
Mason Creek-Willow Creek	PP2	Mason Creek, Culvert stream crossing under CR9	38%	21	30	1.4	MODERATE
Venning Creek – Upper Alkali Lake	PP3	Venning Creek, road crossing into BIA reservation land	34%	21	30	1.4	MODERATE

Channel crossings, floodplains, 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.

A. Estimated Vegetative Recovery Period, (years):	3-5
B. Design Chance of Success, (percent):	90
C. Equivalent Design Recurrence Interval, (years):	5
D. Design Storm Duration, (hours):	6
E. Design Storm Magnitude, (inches):	1.5
F. Design Flow, (cubic feet / second/ square mile):	2 – 7.1
G. Estimated Reduction in Infiltration, (percent):	2 – 17
H. Adjusted Design Flow, (cfs per square mile):	2 – 8.3

PART V - SUMMARY OF ANALYSIS

Introduction/Background

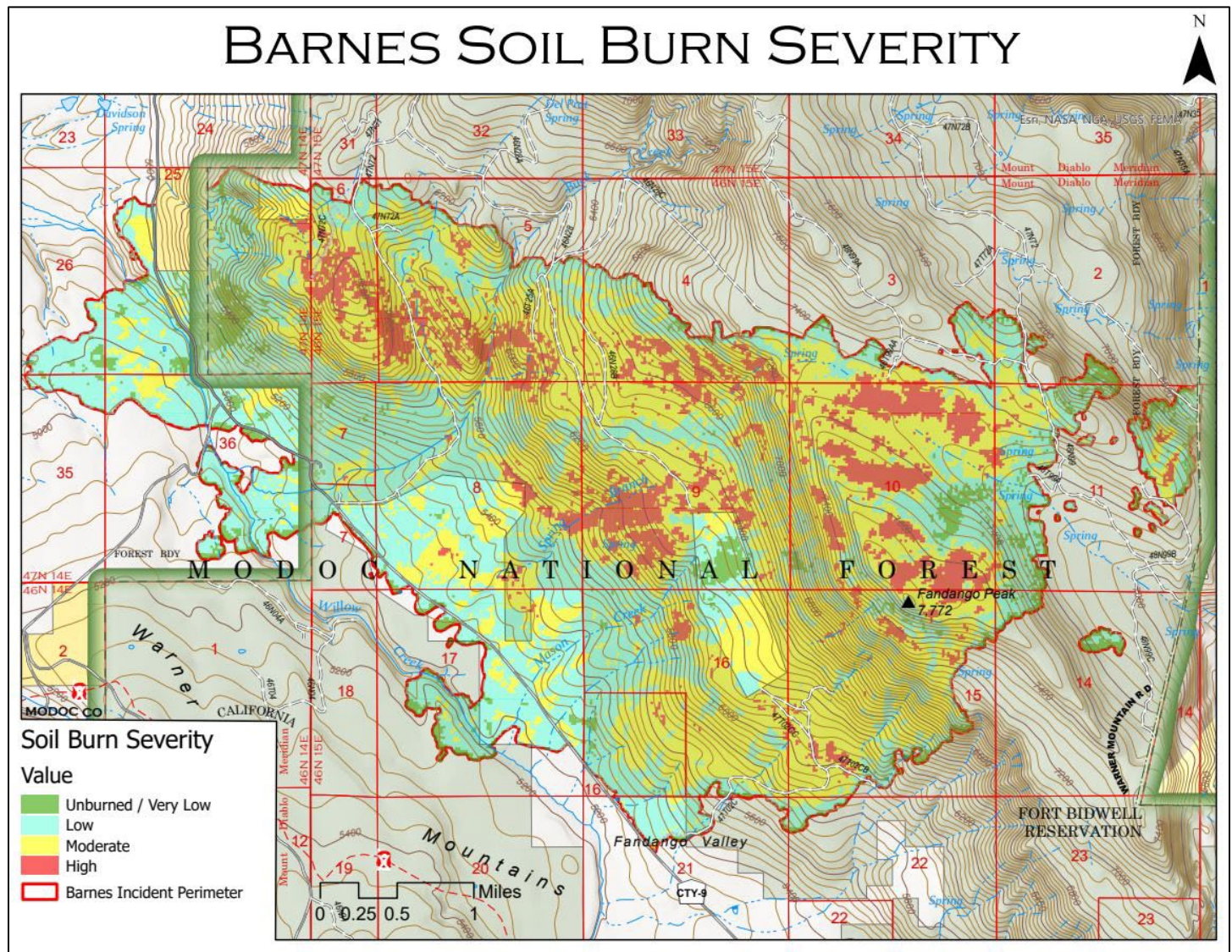
The Barnes Fire started on September 7th, 2022 from a lightning strike in Modoc County burning between the east of Goose Lake at the foot of the Warner Mountains, California. The fire includes National Forest System lands (NFS), within the Modoc National Forest (MDF). Additionally, the fire spread primarily across National Forest System lands, with 5,007 acres burned and 834 acres of private burned for a total of 5,843 acres.

Although the majority of the fire burned at a low burn severity of 47%, the fire did see a moderate soil burn severity of 43%, with a high burn severity of 10% (Table 6). As a result, flows from the burned areas are expected to increase and may be bulked up with sediment, ash and woody debris. There are some larger watersheds within the burned area which could produce significant outflows given the right precipitation event.

The fire was wind and slope driven and moved across the landscape quickly through the shrubs with low heat effects to the soils. There are a lot of steep rocky slopes and potential for debris flows and rockfall within the burn. Most areas under shrub type vegetation lost some amount of soil but remaining surface soils still have roots intact with very little sign of deeper heat into the ground. The timbered areas in the drainages generally burned hotter with longer residence time which resulted in burning of surface fuels and more heat energy moving into the soil. Within the high severity burned areas, there are deeper effects to the soil roots and structure.

As of report date, the fire is 98% contained at 5,843 acres. A BAER assessment team began burn severity mapping field reconnaissance on Saturday, September 23 to verify the imagery received from the Burned Area Reflectance Classification (BARC), with the core BAER team starting assessment on Monday, September 26.

Looking at the soil burn severity map below shows multiple areas that have the majority of moderate and high soil burn severity. These areas are middle Buck Creek, Spring Branch, and north of Fandango Peak.



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

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	

1. Human Life and Safety (HLS):

- Forest Visitors Safety:**

The BAER team identified potential threats to Forest visitors/recreating public, and agency personnel (visiting or post-fire treatments) that are within or downstream/downslope of burned slopes, especially those with a moderate-high burn severity, from flooding and debris flows, hazard trees, loss of ingress and egress along/at roads. The probability of damage or loss is **possible**, resulting from hazard trees along travel routes within the burn area have not been mitigated. Likewise, there are numerous locations within the burn area or directly below moderate/high burn severity that are now at risk from flooding. The

magnitude of consequences is **major**, as a tree strike or entrapment could lead to serious injury or loss of life. As such, the risk is considered **high**.

- BAER funds are requested to treat these risks to install warning signs at all ingress locations of the fire.

2. Property (P): NFS Road (47N72) Del Pratt Road:

There is a threat to NFS road prisms from increased runoff, erosion, and flooding. Undersized and inadequate drainage structures are not expected to convey the expected increase in post-fire runoff and erosion and may damage forest road infrastructure. The probability of damage or loss is **likely**, because the identified NFS road prisms are expected to receive increased overland flow and accelerated erosion concentrating on route segments downslope from areas burned at moderate and high severity. The magnitude of consequences is **moderate**. Increased runoff could lead to failure of these road segments, which could constitute a loss of Forest Service infrastructure and increased sediment delivery to streams and rivers downslope. The resulting risk is **high**.

- BAER funds are requested to treat these risks by storm-proofing drainage features, trash-racks, and conducting storm patrol.

- *NFS Buck Creek Workstation:*

Buck Creek workstation is built on an old alluvial fan from Buck creek (see figure 1 below). Soils are deep gravelly loam on slopes of 2 to 5 percent slope. Buck creek drainage above has slopes of 35 to 50 percent with some historic scarp faces indicating past landslides that probably formed the alluvial fan below. The fan has evidence of braided channels showing evulsion across the fan. With burned out headwalls in both stream reaches the probability of damage to FS infrastructures is **possible** and the magnitude of consequences is **moderate**, thus the resulting risk is **intermediate**.

- BAER funds are requested to treat these risks for life and safety by storm patrol for the workstation and adjacent county road culvert at the workstation.

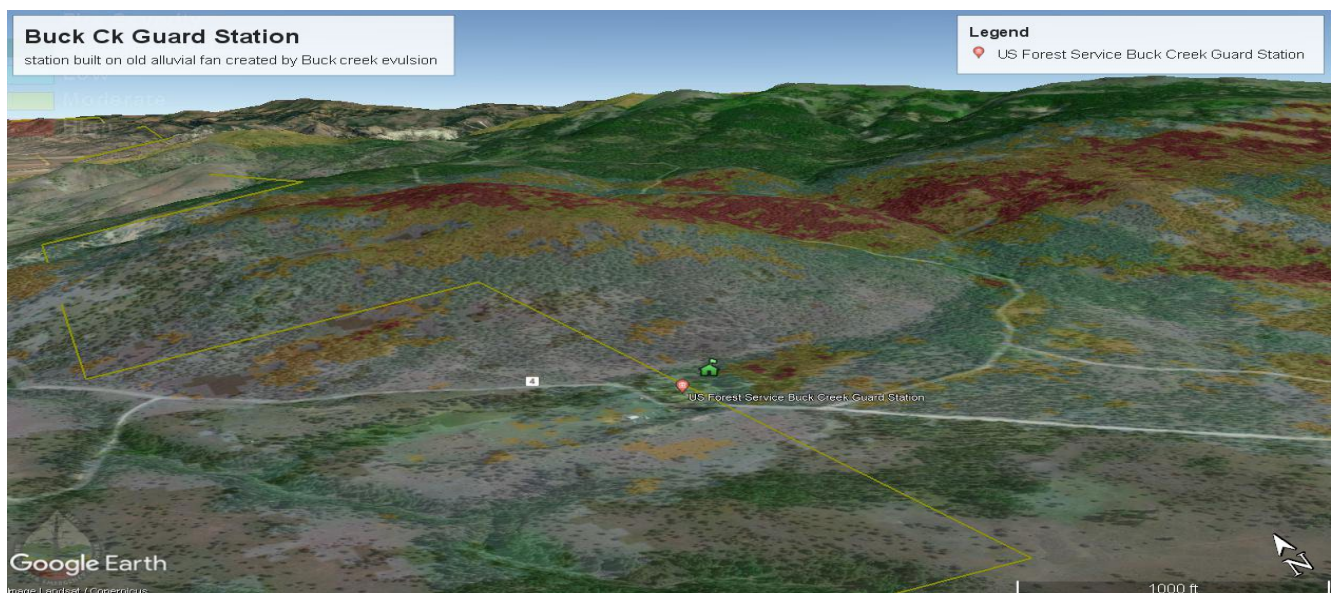


Figure 2: Buck Creek Guard Station sitting on alluvial fan in proximity to high soil burn severity mid-slope headwalls with Willow Ck below.

- *NFS Buck Creek Workstation historic barn:*

The Buck Creek workstation historic barn was destroyed, leaving an unknown storage site that burned posing a hazmat threat due to burned and released chemicals mixing with gas and oil along with building materials creating a toxic cocktail that could be mobilized. This toxic brew of chemicals could be easily move with heavy rains into Buck creek, an important watershed for water quality and T&E fisheries. Buck creek drains directly into Willow creek below that contains 6 listed forest service sensitive aquatic species (see figure 1 & 2). The probability of damage or loss is **likely**, and the magnitude of consequences is **moderate**, so the resulting risk is **high**.

- BAER funds are requested to treat these risks by hazmat stabilization of burned storage barn and surrounding area to ensure sediments do not enter Buck Creek.

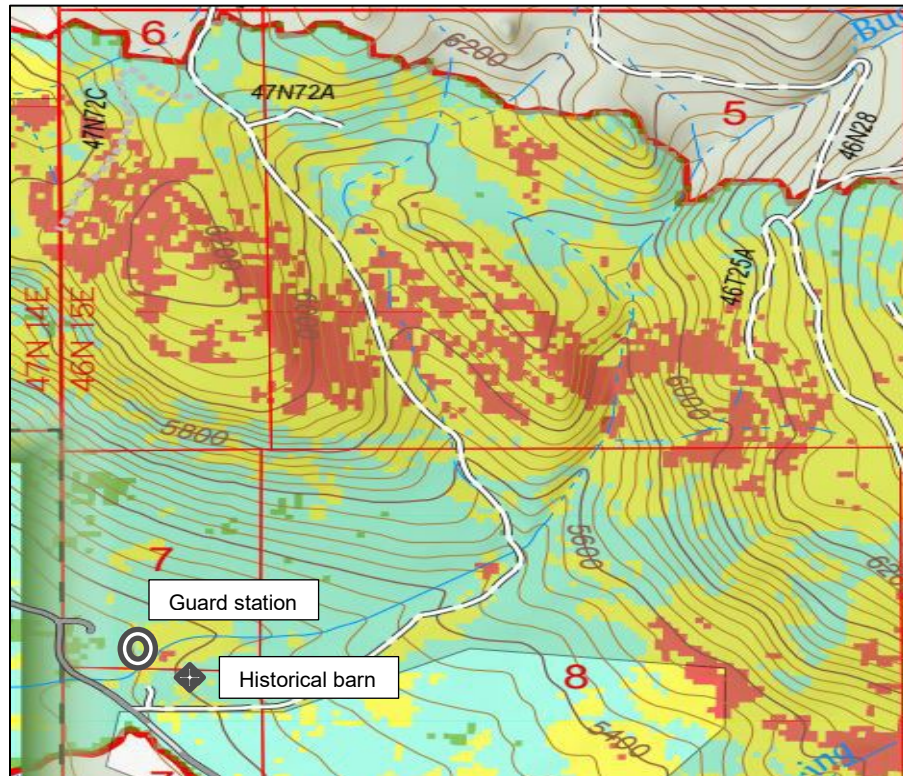


Figure 3: Soil burn severity above Buck Creek Guard Station and historical barn

- **NFS Buck Creek Workstation old water tank**

The Buck Creek workstation water tank was also destroyed, leaving an unknown site that burned posing a hazmat threat due to burned and released chemicals from cresol and asbestos pipes creating a toxic cocktail that is readily mobile. This material could be easily mobilized with heavy rains into Buck creek an important watershed for water quality and T&E fisheries (see figure 1 & 2). The probability of damage or loss is **likely**, and the magnitude of consequences is **moderate**, so the resulting risk is **high**.

- BAER funds are requested to treat these risks by hazmat stabilization of burned water tank and surrounding area to ensure sediments do not enter Buck Creek.

3. Natural Resources (NR):

Threatened Native Botanical Species:

- a. Native and naturalized plant communities un-infested by noxious weeds are considered critical natural resource value during BAER assessments. Following wildfire and associated suppression activities, native communities are at a greater risk for invasion and establishment by invasive species due to the loss of competing vegetation, canopy cover, and duff layers. Invasive species infestations interfere with recovery by displacing native plant communities subsequently impacting the ecological stability of the system. Invasive species can substantially damage these critical natural resource values.
- b. The Barnes Fire and suppression efforts impacted habitat for federally proposed Threatened whitebark pine and one California state rare plant, Baker's globe mallow. Approximately 0.6 miles of dozer line and 1 mile of handline were cut through prime, occupied whitebark pine habitat. The Warner Mountains are home to some of the healthiest stands of whitebark pine in California making protection of these stands' imperative.
- c. The probability of damage or loss of federally proposed Threatened whitebark pine occurrences is **likely** because dozer and handline were constructed through suitable occupied habitat, likely damaging trees, seedlings and saplings. Additionally, the Barnes Fire burned in pockets of moderate and high severity through suitable occupied habitat, likely damaging and stressing mature trees as well as burning regenerating younger trees and damaging critical soil mycorrhizae that aid regenerative seedling establishment. The magnitude of consequence is **major** making them a **very high risk** because neighboring fire-damaged, stressed and dying trees release odors that attract female mountain pine beetles. Once females attack the tree, they release an aggregation of pheromones attracting more beetles to the tree.

Risk to native plant communities from contingency suppression:

The probability of damage or loss is **likely** because suppression actions occurred in areas with an extensive population of dyer's woad and known infestations of the other four invasive plants listed. Extensive use of mechanical equipment with no weed wash station available greatly increased potential vectors for transporting invasive species while also creating conditions prime for invasion by removing canopy cover and competing vegetation. Increased fire traffic during suppression may have brought vehicles and equipment in contact with known weed infestations and spread them into the burned areas. The magnitude of consequences is **moderate**. The resulting risk is **high**.

Risk to native plant communities within the burned area:

Fifty-one percent of the Barnes Fire burned at moderate or high soil severity. Vegetation mortality throughout the burn area is substantial and extensive mineral soil is exposed following consumption of organic materials. This creates conditions that are highly vulnerable to invasion by noxious weeds, which are better adapted to take advantage of nutrient flushes and early successional conditions created by the fire.

The probability of damage or loss is **likely** because known noxious weeds are present within moderate and high severity burn areas. Due to their presence in the seedbed and loss of native overstory to restrain further spread, it is likely and anticipated that invasive plants will spread into vulnerable burned habitat.

The magnitude of consequences is **moderate** because invasive plant species introduction and establishment causes long-term impacts to the health of native plant communities. The Modoc National Forest is limited in herbicide use on invasive plant species. The Modoc National Forest may treat 100 acres or up to 200 acres in an emergency per year. Manual and mechanical removal strategies are primarily used to manage noxious weeds. The resulting risk is **high**.

- BAER funds are requested to treat these risks.

Risk to Federally listed and other special status wildlife species.

- *a. Terrestrial Wildlife species*

There are no federally listed terrestrial wildlife species with the potential to be affected within the Barnes Fire perimeter or affected habitat due to post-fire effects. Four terrestrial wildlife species were identified by using the U.S. Fish and Wildlife Information for Planning and Consultation (IPaC) list (October 2, 2022). North American wolverine, gray wolf, yellow-billed cuckoo, and monarch butterfly were also considered for the potential to be affected by the Barnes Fire. These species were determined to not be affected by the Barnes Fire or fire suppression efforts. As a result, no BAER funds are requested to treat risks to these species.

Two goshawk protected activity centers were within the Barnes Fire perimeter. One PAC was remapped immediately, and the other may be remapped in the future to maintain the best available habitat for this species as in accordance with management direction. No BAER funds are requested to treat risks to this species, or any other Forest Service sensitive, or other special status species.

- *b. Fish Habitat*

- There is no designated critical habitat or ESA listed species within Buck Creek or Willow Creek. There are however 7 aquatic species that are listed on the Regional Foresters Sensitive Species list. Goose Lake redband trout (*Oncorhynchus mykiss* pop 6), Goose Lake sucker (*Catostomus occidentalis lacusanserinus*), Goose Lake lamprey (*Lampetra tridentata* ssp.), Goose Lake tui chub (*Gila bicolor thalassina*), Topaz Juga (*Juga (Calibasis) acutifilosa*), Black Juga (*Juga nigrina*) and Willow Creek Pyrg (Springsnail) (*Pyrgulopsis lasseni*).
- Impacts to habitat may occur from accelerated erosion, flood events, and debris flows that increase sediment delivery, decrease future large wood recruitment, and scour channels. Additionally, where riparian shade has been lost, water temperatures may increase. With a focus upon locales within the fire area with moderate to high SBS, the probability of post-fire impacts to habitat is likely; and magnitude of consequences is moderate.

Within the fire area, site-specific concerns associated with roads in higher SBS locations could result in downslope or downstream impacts to aquatic habitat. For Barnes Fire, no specific priority post-fire risk mitigation need was identified. In association with moderate and high SBS, the road system has been identified as high risk in regard to life/safety and high risk for Forest Service property loss.

- *Treatment Recommendations:* Support engineering and hydrology recommendations of implementing placement of waddles, check dam and storm patrols, to assess the road system as required and determine if there are post-storm failures that need attention. This activity will result in secondary benefits to the 7 sensitive species by not allowing the majority of the sediment to reach key areas of Willow Creek.

4. Cultural and Heritage Resources (CHR):

Watersheds denuded by the fire can cause erosion, debris flow, and storm run-off, which can cut through archaeological sites, damaging cultural deposits, or undermine structures and features. Surface artifacts can be moved or buried by erosion degrading their integrity or causing them to go unrecognized during future surveys. The probability of damage or loss is **possible**, because watersheds denuded by the fire can cause erosion and storm run-off, which can cut through archeological sites, damaging cultural deposits, or undermine structures and features. Surface artifacts can be areas of exposed soil due to fire suppression activities are susceptible to identification. The magnitude of consequences is **moderate**. The resulting risk is **intermediate**.

- Treatment recommendation is district monitoring of sites.

B. Emergency Treatment Objectives:

- Mitigate and protect, to the extent possible, threats to personal injury or human life of forest visitors and Forest Service employees by raising awareness through posting hazard warning signs on roads, reinforcing road tread, improving road drainage, and communicate hazard of flooding and debris flow. Communicate to cooperating agencies and community groups.
- Protect or minimize damage to NFS investments in road infrastructure by installing drainage features capable of withstanding potential increased stream flows and/or debris flows. Minimize damage to key NFS travel routes.
- Protect or mitigate potential post-fire impacts to critical cultural resources within the burned area.
- Treat invasive plants that are a threat to native and naturalized ecosystems by minimizing the expansion of existing populations in the burned area and control of expected invasion of noxious weeds within and adjacent to the area where soils/vegetation was disturbed as a result of the fire and fire suppression activities.
- Protect forest sensitive aquatic fish and snail populations along Willow creek that drains into Goose Lake.
- Assist cooperators, other local, State, and Federal agencies with the interpretation of the assessment findings to identify potential post-fire impacts to communities and residences, domestic water supplies, public utilities and other infrastructure.

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

Land: 95%

Channel: 80%

Roads/Trails: 90%

Protection/Safety: 100%

D. Probability of Treatment Success

Table 10: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land	80	50	35
Channel	80	75	70
Roads/Trails	85	90	90
Protection/Safety	85	95	100

E. Cost of No-Action (Including Loss): \$845,000

Human Health and Safety: Human Life and Safety do not have a market value, but an injury would exceed \$1,000,000, providing a substantial benefit/cost ratio.

Property: The cost to rebuild sections of the road if washed out, eroded, or buried includes estimates to bring in material to build up the damaged roads. The cost of not treating the proposed 1 mile of road under moderate to high burn severity is approximately \$145,800 not including the effect on forest management, fire suppression, and recreation.

Land Treatments – Native and Naturalized Plant Communities: Approximately \$100,000. As such, the benefit/cost ratio exceeds 1.8% (considering loss).

Aquatic species - Approximately \$100,000 per fish species, with 7 listed species of fish and snails the value if lost is \$700,000.

Cultural and Heritage Resources: Economic values cannot be placed on the loss of cultural and heritage resources. The cultural or historic resource at risk is eligible, or potentially eligible, for listing on the National Register of Historic Places (HRHP). No emergency treatment is requested but monitoring and natural recovery is recommended.

F. Cost of Selected Alternative (Including Loss): \$44,650**G. Skills Represented on Burned-Area Survey Team:**

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

Team Leader: Brad Rust

Email: brad.rust@usda.gov

Phone(s): 530-806-5406

Forest BAER Coordinator: Chris Bielecki

Email: chris.bielecki@usda.gov

Phone(s): 530-801-1637

Team Members: Table 11: BAER Team Members by Skill

Skill	Team Member Name
Team Lead(s)	Brad Rust
Soils	Thomas Schmitt (T)
Hydrology	Kaci Spooner
Geology	Thomas Schmitt
Engineering	Chris Bielecki
GIS	Thomas Schmitt
Archaeology	Tracy Stubbs
Weeds	Genevieve Harman (T) and Erin Lonergan

Skill	Team Member Name
<i>Wildlife</i>	Pete Johnston
<i>Fisheries</i>	Megan Solus
<i>Logistics</i>	Brad Rust

H. Treatment Narrative:

Land Treatments: EDRR

Treatment to mitigate mountain pine beetle infestation of whitebark pine includes placing verbenone packets strategically throughout stands. Verbenone is a natural organic compound found in plants and mimics mountain pine beetle anti-aggregation pheromones. It is registered with the EPA as a bio-pesticide. Pouches are placed on trees in spring before beetle flight to protect stands. We will work with Forest Health Protection (FHP) to determine location and correct prescription. FHP has a supply of verbenone they plan to use.

Treatment to mitigate the noxious weed emergency includes early detection surveys to document spread and concurrent rapid response treatments. 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 reduces economic and environmental impacts by controlling infestations when they are small. However, it is important to note that proposed treatments do not capture potential spread from unknown infestations on private land or for propagules brought in on contaminated equipment during initial phases of the fire.

Treatment locations were identified using a combination of GIS models and local knowledge of the area. Initially all suppression features near known impacted infestations and sites in proximity to whitebark pine stands were selected. Selection of treatment locations was further refined using local knowledge of the area to focus on high-risk sites. Table 5 below summarizes survey areas by type and size. Treatment areas may be adjusted if deemed necessary based on field conditions. A map of proposed survey locations is provided in Botany Report.

Table 12 EDRR survey areas by type and size.

Survey location type	Distance/size to survey
Suppression line	24.4 miles
Contingency line	5 miles
Drop points	4 sites at ¼ mile radius
Whitebark pine stands	139 acres

Invasive plant early detection and response (EDRR) will be conducted by MDF seasonal staff and partners. Seasonal staff will focus on surveying areas within the burn and within ¼ mile of contingency and suppression lines. They will map invasive plant sites and manually remove invasive plants where feasible. If a larger site warrants it, repeat mowing treatments may be used in partnership with Engineering staff. Larger infestations will be treated with herbicide by partners using seasonal staff survey data.

Cost Estimate

Costs estimates per unit size are show in Table 6 below. Estimated cost total for herbicide purchase, suppression and contingency line surveys and whitebark pine stand surveys is \$47,050.

Table 13: Cost estimate breakdown for proposed EDRR treatments.

Item	Amount needed for treatment area	Amount per unit	Total cost
2, 4-D	50 gallons	\$75/gallon	\$3,750
Suppression and contingency surveys & manual treatment	29.4 miles	\$1,000/mile	\$29,400
Whitebark pine stand surveys	102 acres	\$100/acre	\$13,900
Total cost			\$47,050

Fisheries Channel Treatments and Water Quality:

In order to reduce likelihood of flooding at both the Buck Creek guard station and at stream crossings along the Del Pratt road (NFS 47N72) and CR 9, it is recommended to employ channel treatments to increase roughness and reduce flow velocity above these values-at-risk. Targeted instream tree placement and staking and hillslope stabilization in Buck Creek to create natural check dams and reduce sediments and stabilize stream banks impinging on the Del Pratt Road (47N72) main culvert and to reduce the likelihood of Buck Creek evulsion out of its main channel towards the Guard Station. Tactical tree felling with force account crews would be utilized, estimated at \$2500. Additionally, in-stream water quality and sedimentation monitoring by FS staff within the Buck Creek Guard Station and above the 47N72 road is recommended.

Table 14: Estimated Costs to Reduce Sediment Delivery, Erosion, and Preserve Critical Fish Habitat

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
TREE FELLING	EA	\$2,500	1	\$2,500
BANK STABILIZATION	EA	\$500	1	\$500
MONITORING & INSTALLATION - LABOR (GS-8 HYDRO TECH)	Day	\$180	8	\$1,500
TOTAL				\$4,500

Roads and Trail Treatments:

Debris racks would be constructed on site at each of the three main culvert crossings of roads over Buck Creek, utilizing local wood and treetops from cut and decked timber. Also, culvert inlets and outlets would be cleaned and brushed to maximize capacity during storms and reduce plugging potential. Finally, cleanup and stabilization with mulch would be employed at the burned barn and water tank areas east and uphill of the station, to ensure no hazmat and pollution reaches Buck Creek. Modoc County Road Dept. would also be notified of particular crossings to pay attention to during storms, including Buck Creek and Mason Creek.



Figure 4: The three crossings of roads over Buck Creek in the fire footprint.

Table 15: Debris Racks and Culvert Preparation (brushing + cleaning)

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
CULVERT PREP	EA	\$1,300	3	\$3,900

Table 16: Stabilization & Cleanup At Burned Facilities Above Buck Creek

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
SITE STABILIZATION	EA	\$2,500	1	\$2,500

Storm Inspection and Response

Roads that are in and below areas of moderate/High burn severity need to be monitored during and after storm events. Storm inspections and response will ensure the existing drainage features are functioning, clean the area to ensure they continue to function in the future, and maintain and/or repair any damage to the road surface due to runoff and sediment delivery.

Table 17: Initial Storm Inspection and Response Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
STORM INSPECTION AND RESPONSE	Day	\$750	8	\$6,000

Entering Burn Area Warning Signs

"Entering Burn 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, and flash floods. Signs are placed in entry points that are expected to receive high use, or popular roads used for recreating. Signs will be attached to t-posts and removed once hazards are mitigated.

HLS1: The cost for warning signs is \$1250.

Table 18: Initial Road Warning Sign Cost Estimate

TREATMENT	UNIT	UNIT COST	# OF UNIT	TOTAL COST
INSTALL WARNING SIGNS	EA	\$250	5	\$1250

I. Monitoring Narrative:

In order to gauge effectiveness of reducing sediment load into Buck Creek and maintaining water quality (increase flow rates, turbidity, channel morphology) monitoring is needed during and after instream tree placement monitoring to ensure treatments are working and effective. The higher elevation, perennial creek portion of Buck Creek consists of well confined step-pools above the water crossing on the 46N72 which begins to braid out into a more alluvial setting below. The high burn severity is concentrated in a belt across the upper elevations of the drainage basin and is buffered with low burn severity both above and below.

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Barnes BAER		NFS Lands				Other Lands				All
Line Items	Units	Unit Cost	# of Units	BAER \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	Total \$
A. Land Treatments										
EDRR - Suppression & Burn	Project	33,150	1	\$33,150	\$0		\$0		\$0	\$33,150
Whitebark Pine Protection	Acre	136	102	\$13,903			\$0		\$0	\$13,903
<i>Subtotal Land Treatments</i>				<i>\$47,053</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$47,053</i>
B. Channel Treatments										
Bank Stabilization	Project	4,500	1	\$4,500	\$0		\$0		\$0	\$4,500
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				<i>\$4,500</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$4,500</i>
C. Road and Trails										
Storm Patrol and Response	Project	750	8	\$6,000	\$0		\$0		\$0	\$6,000
Culvert Cleanouts & Trashracks	Each	1,300	3	\$3,900	\$0		\$0		\$0	\$3,900
<i>Subtotal Road and Trails</i>				<i>\$9,900</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$9,900</i>
D. Protection/Safety										
Hazard Warning	Each	250	5	\$1,250	\$0		\$0		\$0	\$1,250
Hazmat Stabilization	Project	2,500	1	\$2,500	\$0		\$0		\$0	\$2,500
<i>Subtotal Protection/Safety</i>				<i>\$3,750</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$3,750</i>
E. BAER Evaluation										
Initial Assessment	Report			\$30,616	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				<i>\$30,616</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$0</i>
F. Monitoring										
Bank Stabilization Monitoring	Project	1,000	1	\$1,000	\$0		\$0		\$0	\$1,000
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				<i>\$1,000</i>	<i>\$0</i>		<i>\$0</i>		<i>\$0</i>	<i>\$1,000</i>
G. Totals										
Previously approved				\$66,203	\$0		\$0		\$0	\$66,203
Total for this request				\$66,203						

PART VII - APPROVALS

1. _____
 Forest Supervisor Date