
Emergency Stabilization & Rehabilitation Plan

CALDWELL FIRE

Lava Beds National Monument, California



Submitted by: _____ Date: _____

Lawrence J. Whalon, Jr. Superintendent



September 2020



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Unit Summary Information

Unit Name	Lava Beds National Monument
Unit Identifier	LABE
NPS Region	Pacific West (Interior Region 10)

Fire Summary Information

Fire Name	Caldwell
Fire Number	2020-CABNP-000479
Fire Code	NAXO
Detection Date/Cause	July 21, 2020/Lightning
Date Contained	N/A
Acreage	80,859 NPS=32,667 USDA, Forest Service=45,907 US Fish and Wildlife Service=276 Private=2,009

Fire Name	Gillem
Fire Number	2020-CAMDF-000557
Fire Code	N/A
Detection Date/Cause	July 27, 2020/Lightning
Date Contained	N/A
Acreage	See Caldwell Fire

Account Numbers

Emergency Stabilization (Plan Preparation), FY20

Fund	20XP112585
Cost Center	PPPWLABEFO
Functional Area	PF220ES85.RM0000
WBS	PF.FENAX0020.00.1

Emergency Stabilization (Implementation), FY20

Fund	20XP112585
Cost Center	PPPWLABEFO
Functional Area	PF220ES85.RM0000
WBS	PF.FENAX0020.00.2

Team Members

<i>Position</i>	<i>Name & Affiliation</i>
Team Leader	Jack Oelfke, North Cascades NPS Complex
PWR Regional BAER Coordinator	Nelson Siefkin
Deputy, GIS, Documentation	Trisha Johnson, Colville Confederated Tribes
Cultural Resource Management	Joseph Svinarich, Whiskeytown NRA Jessica Reid, Lava Beds NM David Curtis, Lava Beds NM Hunter Watry, Lava Beds NM Christopher Combel, Lava Beds NM Elena Ricci, Lava Beds NM Keoni Diacamos, Lava Beds NM
Natural Resource Management	David Hays, Lava Beds NM Patricia Seiser, Lava Beds NM Noah Hoffman, Lava Beds NM Chelcie Pierce, Lava Beds NM Bridget Murray, Lava Beds NM Emma Sutphin, Lava Beds NM
Public Safety	Jaime Smith, Lava Beds NM
Maintenance /Facilities	Don Bowen, Lava Beds NM

EXECUTIVE SUMMARY

INTRODUCTION

This joint Emergency Stabilization (ES, also called Burned Area Emergency Response [BAER]) and Burned Area Rehabilitation (BAR) Plan has been prepared for the Caldwell Fire in Lava Beds National Monument (LBE), California. The Caldwell Fire was ignited by lightning in the Caldwell Butte area on July 21, 2020. It burned extensively within LBE, and also spread to adjacent USDA Forest Service, US Fish and Wildlife Service and private lands to the south, east and north of the monument. On July 27, another lightning strike on Gillems Bluff in the northwestern corner of LBE ignited the Gillem Fire, which soon merged with the Caldwell Fire perimeter to the east (and also spread onto adjacent USDA Forest Service lands). For the purposes of this plan, the comparatively small area of the monument burned by the Gillem Fire is considered part of the Caldwell Fire. Collectively, the Caldwell and Gillem Fires burned 32,667 acres within LBE, or about 70% of the monument.

LBE was established in 1925 to protect and interpret volcanic and natural features of scientific interest associated with the Medicine Lake shield volcano, and evidence of prehistoric and historic human settlement, use and conflict. Among the exceptional values preserved within the monument include:

- The largest concentration of lava tubes in the United States, with associated cave environments and cave-dependent ecosystems, and other outstanding examples of volcanic geologic features.
- A rich archeological record of human settlement dating to more than 10,000 years before present, including exceptional rock art, with continued significance to the Modoc people as part of their traditional homeland.
- Objects, sites, and the rugged volcanic setting associated with the 1872–73 Modoc War.
- Natural processes and native plant and animal species representative of the transition zone for Great Basin and Cascade ecosystems.
- 28,460 acres of designated Wilderness in the unique volcanic landscape of the Great Basin and Cascade ecosystems.

Various recreational opportunities, including caving, hiking and camping, attract more than 100,000 visitors to the monument per year. Visitation peaks in the spring through fall months, and has been particularly high during the SARS-CoV-2 (COVID-19) pandemic as the public seeks outdoor recreation activities.

POLICY AND GUIDANCE

The plan has been developed in accordance with Department of the Interior (DOI) and National Park Service (NPS) policy and guidance, including:

- *Office of Wildland Fire (OWF) Policy Memorandum 2016-01 (Post-Wildfire Recovery Program and Policy Changes)* [\[LINK\]](#)
- *Interagency Standards for Fire and Fire Aviation Operations, FY2020* [\[LINK\]](#)
- *NPS Reference Manual 18 (Chapter 18)* [\[LINK\]](#)
- *NPS Wildland Fire & Aviation Management Business Rules, FY2019* [\[LINK\]](#)
- *Interagency Burned Area Emergency Response Guidebook (Version 4.0)* [\[LINK\]](#)
- *Interagency Burned Area Rehabilitation Guidebook (Version 1.3)* [\[LINK\]](#).

The primary objectives of the BAER program are to assess the need for and prescribe cost effective post-fire stabilization measures necessary to protect human life, property, and critical cultural and natural resources. The BAR program is intended to protect resources by repairing or improving burned landscapes unlikely to recover naturally to desired management conditions and to repair or replace fire-damaged minor assets. BAER and BAR are conducted in accordance with approved land management plans and policies, and all relevant federal, state and local laws and regulations.

BAER and BAR are intended to address imminent (<1 year) and short-term (<5 years) threats caused by wildfire, respectively; neither program is responsible for long-term management or rectifying deficiencies that existed prior to the fire. DOI and NPS BAER policy echoes federal wildland fire policy regarding protection priorities: human safety is first, and property and critical cultural and natural resources are ranked based on the relative values to be protected, commensurate with emergency stabilization and rehabilitation costs.

The basis of the BAER and BAR assessment process is identifying, evaluating, and protecting, repairing, or replacing values at risk (VARs)—human safety, properties, capital improvements and cultural and natural resources—located within and downstream of burned areas, and impacted by fire and/or vulnerable to post-fire conditions. When evaluating a given VAR, consideration is given to the significance of the value, probability of damaging events occurring, the magnitude of potential consequences, and the feasibility to mitigate.

LOCAL MANAGEMENT PLANS

Pertinent approved land and resource management plans and other documents that guided the preparation of this plan include:

- 2011 Lava Beds National Monument General Management Plan and Environmental Assessment
- 1990 Lava Beds National Monument Cave Management Plan, and 2009 Draft Cave Management Plan
- 2012 Lava Beds National Monument Resource Stewardship Strategy
- 2006 Wilderness Stewardship Plan
- 2017 Lava Beds National Monument Foundation Document

- 2020 Lava Beds National Monument Fire Management Plan, in progress

ASSESSMENTS AND SPECIFICATIONS

Eight specifications— six ES and two BAR—are proposed through this plan to address post-fire issues related to the Caldwell Fire. These are summarized in the tables below, and described in greater detail by subject matter area assessments. Additional FY21 BAR requests for post-fire vegetation management will be submitted at a later date. Non-specification recommendations, which would be financed from sources other than ES or BAR, were also identified during the post-fire assessment process.

EMERGENCY STABILIZATION SPECIFICATIONS

ID	SPECIFICATION NAME	FY20	FY21	FY22	FY23	TOTAL
ES-1	BAER Plan Preparation	\$50,673	\$0	\$0	\$0	\$50,673
ES-2	Implementation Leader	\$0	\$35,000	\$17,200	\$17,200	\$69,400
ES-3	Public Safety and Resource Protection	\$41,733	\$8,584	\$0	\$0	\$50,317
ES-4	Increased Agency Presence	\$38,650	\$168,741	\$0	\$0	\$207,391
ES-5	Storm Patrol and Road Cleanup	\$0	\$14,128	\$7,284	\$3,750	\$25,162
ES-6	Cultural Site Stabilization	\$3,084	\$0	\$0	\$0	\$3,084
TOTAL		\$134,140	\$226,453	\$24,484	\$20,950	\$406,027

BURNED AREA REHABILITATION SPECIFICATIONS

ID	SPECIFICATION NAME	FY21	FY22	FY23	TOTAL
BAR-1	Repair/Replace Minor Facilities	\$71,558	\$0	\$0	\$71,558
BAR-2	Increased Trail Maintenance	\$8,648	\$8,740	\$9,062	\$26,450
TOTAL		\$80,206	\$8,740	\$9,062	\$98,008

Public Safety and Resource Protection Assessment

Issues

- The overall post-fire threat to public safety from the Caldwell Fire within the monument is low.
 - 14 regulatory signs were damaged or destroyed by the fire.
 - Significantly increased post-fire watershed response is not anticipated due to highly permeable geology and overall low soil burn severity. Burned slopes on Caldwell Butte will likely create nuisance sedimentation on Road 10 until vegetation regrows. The fire will not appreciably increase rockfall from slopes above Road 10 in the Devils Homestead/Gillems Bluff area. Minor rockfall and nuisance erosion may occur on certain monument trails and developed sites.
 - All known hazard trees around monument facilities have been mitigated. Others may be identified through ongoing assessments and due to delayed mortality.
- All publicly-accessible monument road miles and 80% of monument trail miles have at least one margin on or within the Caldwell Fire perimeter. Additionally, over 15 miles of

the eastern and southern monument boundary burned, likely resulting in impacts to existing NPS property markers. The increased opportunity for public access over the highly-exposed, burned monument landscape presents a variety of management concerns, including:

- Hunter trespass from adjacent Modoc National Forest and private lands.
- Creation of social roads and trails and impeded vegetation recovery.
- Visitor impacts to large numbers of sensitive cave and cultural resources located near existing roads and trails.
- Spread of exotic invasive plant species.

Because of these threats, it is recommended that, with the exception of certain developed sites, the burned area within the monument remain closed to visitors to allow for resource protection until such time as vegetation has sufficiently recovered.

Recommendations

- **ES-3, Public Safety and Resource Protection:** This specification addresses the public safety and resource protection concerns in the burned areas of the monument through sign installations, including:
 - Replace 14 burned regulatory signs in-kind.
 - Install four signs warning of road hazards (rocks, debris) on Road 10 in the Caldwell Butte and Devils Homestead/Gillems Bluff areas.
 - Install signs along monument roads informing visitors of a burned area closure.
 - Install stanchion and rope barricades at key visitor sites (e.g., Schonchin Trail, Skull Cave pullout, Cave Loop, Valentine Cave pullout, Black Crater, Balcony Cave, Captain Jacks Stronghold) to prevent entry into recovering burned areas.
 - Install standard NPS metal and carsonite property markers as appropriate on the eastern and southern monument boundaries.
- **ES-4, Increased Agency Presence:** This specification finances personnel from various disciplines—law enforcement, natural resources, cultural resources, interpretation—to serve as the “eyes and ears” within the Caldwell Fire as a means of monitoring the burned area closure and interfacing with monument visitors. This method was successfully employed following the 2008 Jack Fire. Field activities will include post-fire resource assessments, treatment monitoring, and visitor contacts. Additionally, this specification supports the production of interpretive material (e.g., information signs, social media) related to the closure.
- **ES-5, Storm Patrol and Road Cleanup:** This specification covers costs associated with patrol and removal of debris from Road 10 in the Caldwell Butte and Devils Homestead/Gillems Bluff areas following storm events. The budget includes funding for eight events in FY21, four in FY22, and two in FY23.

Natural Resources Assessment

Issues

- Vegetation
 - High burn severity was typical of the grass and shrubland communities in the central and northern portions of the monument. Invasion by exotic annual grasses is a significant concern in some of these areas.
 - Juniper woodland experienced mixed burn severity. Post-fire response will likely be driven by fire severity and proximity to previously grazed and non-native weed infested areas. The “old growth” juniper woodlands of the Valentine Flow will likely return to that state, albeit with less structural complexity.
 - High intensity burnout operations on Caldwell Butte resulted in severe impacts to ponderosa pine forest, and pines on Schonchin Butte were similarly affected. Pine reestablishment in those locations is doubtful due to increasingly dry winters. By contrast, large ponderosa pine stands near the southern monument boundary and in Hidden Valley fared well during the Caldwell Fire.
- Wildlife
 - Townsend’s big-eared bats experienced no discernable direct mortality during the Caldwell Fire. Mexican free-tailed bats have yet to be assessed. Foraging areas for both species were burned. Potential fire-induced changes to in-roost habitat are of particular concern for Mexican free-tailed bats.
 - Pika within the burned area have likely lost much of their forage vegetation in close proximity to block lava flows and cave refugia.
 - A snag containing a bald eagle nest on Boundary Butte was charred but standing. An adult and fledged juvenile eagle were observed occupying the nest.
- Caves
 - Assessments of visitor-use caves revealed no structural damage or rockfall issues.
 - The loss of vegetation has greatly enhanced the visibility of undeveloped caves from monument roads and trails. These caves are vulnerable to discovery and disturbance, as well as widespread advertisement via social media platforms.

Recommendations

- **ES-4, Increased Agency Presence:** This specification finances personnel from various disciplines—law enforcement, natural resources, cultural resources, interpretation—to serve as the “eyes and ears” within the Caldwell Fire as a means of monitoring the burned area closure and interfacing with monument visitors. Field activities for natural resources protection will include monitoring caves, wildlife, and vegetation for post-fire and visitor impacts.

Minor Facilities Assessment

Issues

- The Caldwell Fire damaged numerous minor facilities within the monument that are critical for management and visitor experience, including:
 - Wooden information signs at trailheads, pullouts and roadsides.
 - Metal and carsonite informational signs throughout the monument.
 - Indian Well Campground: picnic tables, site markers, amphitheatre siding and benches, informational signs.
 - Schonchin Butte Trail: Interpretive bulletin board at trailhead, wooden benches along trail.
 - Gillems Bluff: Wildland Fire Danger sign.
- Eighty percent of the monument trail miles lie within the Caldwell Fire perimeter. Rapid assessments performed on the Schonchin Butte, Thomas and Wright Battlefield, Caldwell and Bunchgrass trails revealed little or no direct damage from the fire. However, monument trails will likely require increased maintenance, including drain cleaning/construction, tread stabilization and debris removal.

Recommendations

- **BAR-1, Repair/Replace Minor Facilities:** This specification funds the in-kind repair or replacement of fire-damaged minor facilities as appropriate in FY21.
- **BAR-2, Increased Trail Maintenance:** This specification finances an experienced trail crew from Crater Lake National Park (or another NPS unit) to perform increased trail maintenance for up to three years post-fire.

PLAN ORGANIZATION

This plan includes a narrative summary of the Caldwell Fire, followed by in-depth resource or issue specific burned area assessments, and itemized specifications for BAER and BAR treatments and activities. Appendices, including environmental compliance and select maps and tables, are provided at the end of the plan.

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CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

FIRE NARRATIVE

The Caldwell Fire was ignited by a lightning strike on the afternoon of July 21, 2020 on the eastern margin of Caldwell Butte in the southeastern corner of Lava Beds National Monument (LBE) (Figure 1). This area was one of the few areas in LBE with no recorded fire history (Figure 2), and it contained a heavy growth of bitterbrush and sagebrush intermixed with western juniper and ponderosa pine. Adding to the complexity, the fire occurred in the midst of the COVID-19 pandemic.

The Caldwell Fire was detected in the late morning of July 22. Stoked by warming temperatures and low relative humidity, the fire grew to six acres by 1200, with 4-8 foot flame lengths, torching and spotting, and moderate rate of spread observed. Initial attack comprised of three engines and a water tender supported by aerial retardant drops was unsuccessful at containing the fire.

A Type 3 Incident Commander assumed command of the incident at 1400. The onset of gusty winds associated with thunderstorm activity rapidly pushed the fire to the east and south onto adjacent Modoc National Forest lands. By 1600, the fire was estimated to be 500-700 acres, prompting an advisory evacuation of the community of Tionesta, California and notification of threats to major energy (high-voltage powerlines, gas pipelines) and transportation (rail) infrastructure.

A pre-positioned Type 1 Incident Management Team (IMT, Nobles) was ordered for the Caldwell, Allen, and Dalton Fires, combined as the July Complex, on July 23 as the Caldwell Fire reached 7,900 acres. The IMT inbriefed on the afternoon of July 23 and assumed command of the July Complex on the morning of July 24. LBE contributed to Wildland Fire Decision Support System (WFDSS) analysis for the Caldwell Fire. Objectives and Management Requirements for the monument focused on firefighter, employee, and public safety; smoke management; and the protection of cultural resources, natural resources, and wilderness values through the use of Resource Advisors and tactical restrictions. A "Full Suppression" decision was selected.

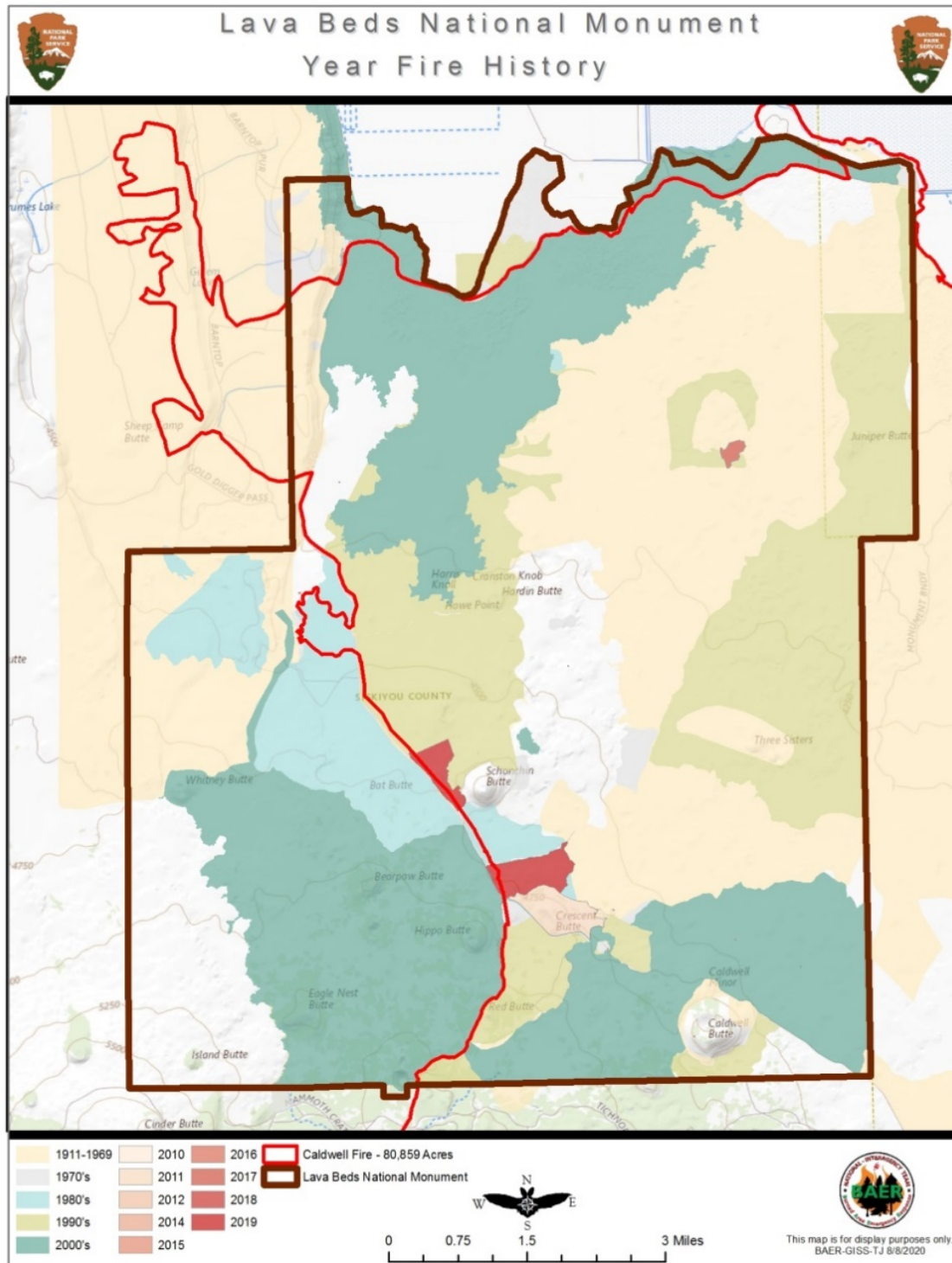


Figure 2. Lava Beds Fire History.

Active fire behavior continued overnight, and suppression actions on July 23 were focused on preventing fire spread on Modoc National Forest and private lands. Active fire behavior rendered these efforts ineffective, and the onset of unstable weather due to thunderstorms resulted in extensive fire spread to the south with sustained crown runs in timber.

The Caldwell Fire was assigned to Branch III by the IMT, and portions of three Divisions (C, E, and X) were included within LABE. On July 24, the few resources assigned to these Divisions focused on direct and indirect line construction on Modoc National Forest. The Caldwell Fire grew to nearly 12,000 acres, with most spread to the west on Modoc National Forest and private lands. Fire growth on LABE was minimal and restricted primarily to the eastern boundary of the monument.

On July 25, LABE Archeologist, David Curtis, was assigned to the Caldwell Fire as a Resource Advisor (READ) within the monument. The Division C/E beak was moved south onto Modoc National Forest, leaving Division E (southwest of the LABE Headquarters) and Division X (east of the LABE Headquarters) within the monument. Of these, only Division E was staffed with resources. Several engines, water tenders, and dozers were staged at the LABE Headquarters and a hot shot crew was tasked with preparing existing road and trail systems from the LABE Visitor Center and Road 10 to the Medicine Lake Road. Fire spread slowed somewhat as the Caldwell Fire grew to just over 13,000 acres. Fire activity remained predominantly on Modoc National Forest and private lands south and east of the monument.

With Red Flag conditions projected for the following day, emphasis was placed on fireline construction and improvement in the Medicine Lake area and within LABE on July 26. Additional resources, including crews, engines, and dozers were assigned to Division E; and Division X was similarly staffed, with direction to prepare existing roads and trails to the monument boundary south and east of the LABE Headquarters, respectively. That afternoon, gusty, erratic outflow winds caused by thunderstorm cells over the Caldwell Fire pushed the eastern portion of the fire over nine miles to the north in only one hour, overrunning the firelines on Division X, and prompting evacuations in the southern Tule Lake Basin. This run and subsequent fire spread burned a large swath through the eastern third of the monument, and Modoc National Forest and private lands to the east, adding more than 30,000 acres to the Caldwell Fire.

With the previous day's fire spread, the Caldwell Fire northern control objective shifted from existing roads and trails in the central portion of LABE to Road 120 near the northern monument boundary on July 27. On the west, the objective remained keeping fire east of Road 10 and the Medicine Lake Road. Firefighting resources focused on burning out from the aforementioned control lines, which was largely successful despite erratic outflow winds associated with thunderstorm activity. A spot fire near the northeastern corner of the monument burned a small portion of LABE north of Road 120, and subsequently spread into

dense wetland fuels and organic-rich soils on US Fish and Wildlife Service lands to the north. Another spot fire occurred west of Road 10 near Fleener Chimneys, but westward spread was curtailed by lava flows. In addition, fire activity was detected on Gillem's Bluff in the northwestern corner of LABE. Although originally believed to be a spot from the Caldwell Fire, the Gillem Fire was actually the result of a new lightning strike. In the monument, the Gillem Fire backed down Gillem's Bluff to Road 10, where it met the Caldwell Fire perimeter. It also spread to Modoc National Forest lands to the west, where aggressive suppression actions were taken. Finally, erratic afternoon winds caused the Caldwell Fire to spread rapidly toward LABE Headquarters from two directions, prompting the initiation of structure protection and burnout operations. No structures were lost, but the LABE campground, maintenance storage yard, and Cave Loop developed area burned over, resulting in damages to numerous minor facilities. In the evening, a light rainfall fell, moderating fire activity. Between natural fire spread and burnout operations, the Caldwell Fire grew more than 25,000 acres, and now totaled nearly 70,000 acres.



Overview of Burned Area

Fire activity in LABE was comparatively quiet on July 28, but a Red Flag Warning for July 29 prompted the IMT to aggressively begin firing unburned interior areas within the monument, particularly around Road 120, Devil's Homestead, Schonchin Flow, and the triangle between Caldwell Butte, Medicine Lake Road and LABE Headquarters. Some of these burnout

operations resulted in high burn severity, particularly the north aspects of Caldwell, Crescent, and Schonchin Buttes and other areas of heavier fuel accumulation. The Caldwell Fire gained nearly 10,000 acres on July 29, most of it within the monument (Figure 3).

Gusty conditions tested control lines on July 30, but none were compromised. The interior of the monument continued to burn, particularly the heavy fuels on and west of Caldwell Butte. From July 31, the incident transitioned into mop-up and suppression damage repair.

Suppression damage in the monument was limited to short stretches of minimal handline near the northern and southern boundaries and clean-up needs in the Headquarters area. Based on the final fire perimeter, the Caldwell Fire burned 32,667 acres within LABE, and 80,859 acres total.

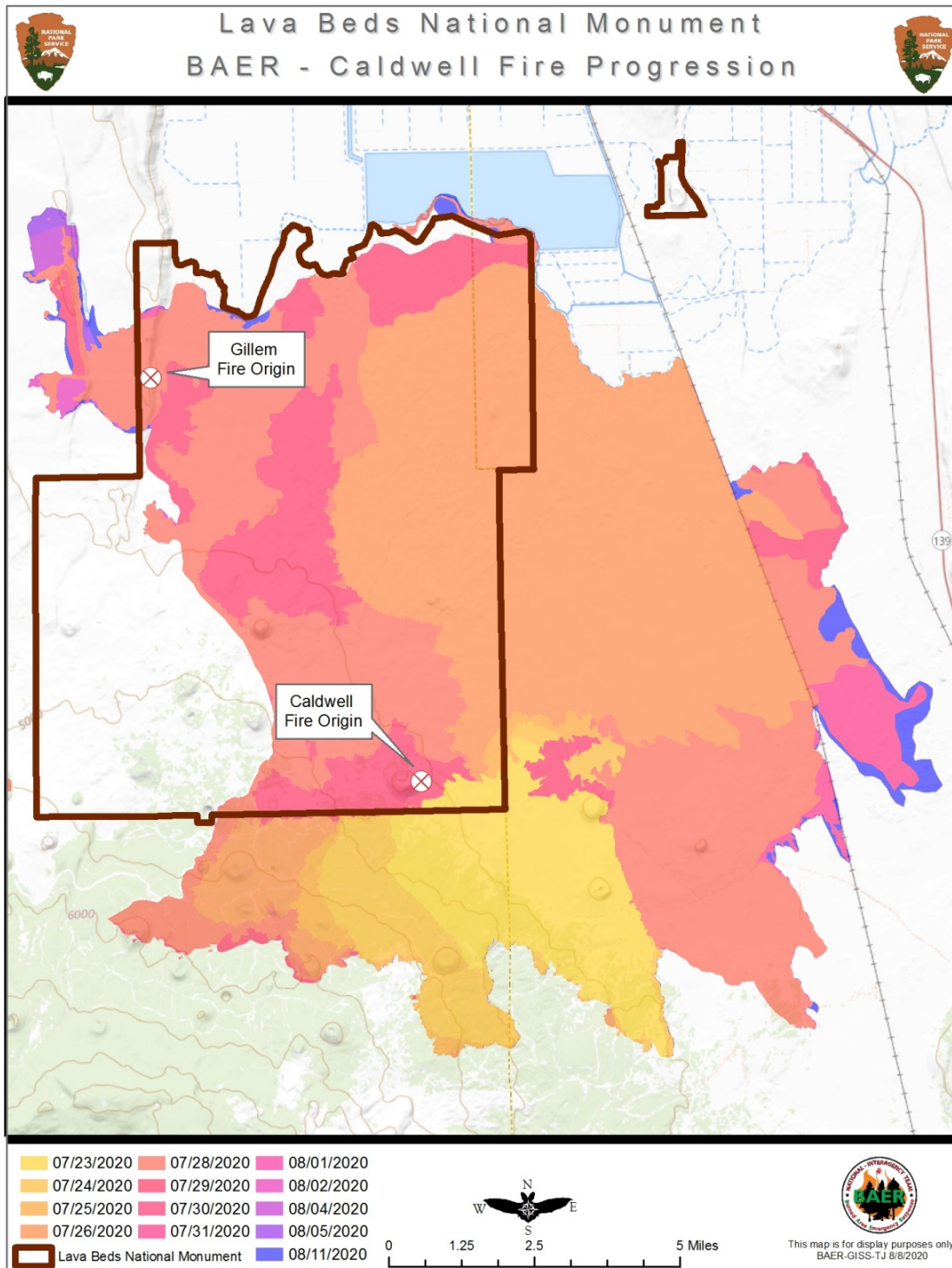


Figure 3. Fire Progression Map.

CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

BURNED AREA ASSESSMENTS



Lava Beds National Monument Campground

CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

PUBLIC SAFETY AND RESOURCE PROTECTION ASSESSMENT

OBJECTIVES

- Identify and prevent/mitigate threats to human safety when employees and the public enter burned areas.
- Identify and prevent/mitigate threats to critical cultural and natural resources prior to opening the burned area to the public.
- Identify and mitigate threats to human safety from slope erosion events.

ISSUES

- Visually open landscapes created by the Caldwell Fire facilitate access into rough and hazardous volcanic terrain. Locations of significant concern include numerous areas and pullouts along the main monument road (Route 10, or “10 Road”); Schonchin Butte Lookout; Captain Jack’s Stronghold; and Cave Loop road. These areas are a concern for public and employee safety as well as impacts to cultural and natural resources from visitor use.
- Although watershed erosional issues are not common on the monument landscape, the burned steep slopes at a few specific locations do pose potential slope erosion issues to the main monument road.

BACKGROUND

The primary road in the monument is the 10 Road, extending for roughly 17.6 miles within LABE. The Medicine Lake road covers an additional 2.6 miles in the south-central part of the monument. There is a network of roughly 58 miles of trails within LABE open to visitor use.

Regulatory signs provide needed warnings and traffic control to ensure park visitors safely navigate park roads. Speed limits, stop signs, curve warnings, etc. are all examples of such regulatory signs that our public expects to see along public roads to promote driving safety.

The monument shares its south and east boundaries with the Modoc National Forest, along which NPS boundary signs provide the public with the awareness of where hunting is allowed (Forest Service) or not allowed (NPS).

Similarly, installing signs and structures that clearly inform the public of off-limits burned areas not only enhances public safety for those who are unaware of the numerous hazards in burned

terrain, but also aims to prevent public access near sensitive cultural and natural resources. Archeological sites at LABE are protected, in many cases by vegetation, and with the landscape now denuded of that vegetative cover those sites are threatened from enhanced visibility and exposure. If burned areas are accessed by the public, the threat of artifact displacement, feature destruction, and looting or theft of artifacts is increased. Formally designated cultural landscapes such as the Modoc War Historic District protect landscape-level resources – in this case, preserving the open landscape and vista associated with Modoc descendant's physical connection to the north end of the park. Equally, sensitive resources adjacent to or associated with caves will become more easily visible by the public, potentially leading to vandalism, or disturbance to wildlife, microbial communities, invertebrates, entrance vegetation, and in a few cases ice deposits.

The concerns of visitor safety, unlawful entry into burned areas, and associated resource vulnerability are all exacerbated by dramatically increased monument visitation recorded prior to the fire. Annual recreational visits for June during the period of 2013-2019 averaged 19,679 visitors, with the largest count of 30,786 in 2014. Meanwhile, in 2020, recreational visitor numbers in June reached 63,402, a staggering 300% increase over the last seven-year average. It is anticipated that this increase in visitation will continue, at least into the winter months coinciding with the current time when the resource is quite exposed due to the fire.

Hazard trees are common following fire events, but by definition a tree is a hazard only if there is a target/value at risk that it can strike. Juniper and/or ponderosa pine trees are prevalent in many parts of the burned area.

Due to the unique geology of the monument landscape and because water generally drains quickly into the soils, watershed concerns following fire events generally are not an issue at LABE. The Jack Fire in 2008, which burned over 5,400 acres within the park, had no documented watershed issues, for example. However, in areas of the park where steep slopes have burned, potential does exist for downslope movement of rock or soil, particularly following heavy rainfall events. If there are values at risk below those slopes, such as roads, structures, or developments that attract visitor use, evaluation of those risks is necessary to determine potential mitigations to protect those values and protect the safety of visitors and employees.



Burned Regulatory Sign along 10 Road

RECONNAISSANCE METHODS

All public entry into the park was closed when the Caldwell Fire began, and the closure continued until limited public entry (10 Road, Cave Loop Road) was permitted beginning Aug. 14, 2020. Prior to this date, monument staff completed an inventory of burned regulatory signs (stop signs, speed limits, etc.) and began replacement of them. LABE staff also developed and began installing “Burned Area Closed” signs along the 10 Road to prevent visitor access into the burned area.

Field trips were made to several locations by various monument staff to survey burned signs before the BAER Team arrived (August 5-17, 2020), and a combination of LABE staff and BAER Team personnel documented concerns regarding sensitive resource exposure (cultural and natural resource concerns) throughout this process. BAER Team Leader Jack Oelfke and BAER GIS Specialist Trish Johnson examined Red Butte for erosion concerns on August 9th. On August 13th, Oelfke accompanied US Forest Service BAER Team personnel (and soil scientists) Brad Rust and Eric Nicita to consider slope erosion concerns at two locations: Devil’s Homestead/Gillem’s Bluff and Caldwell Butte. All these efforts focused on identifying and documenting potential hazards and resource sensitivity associated with post-fire conditions on the Caldwell Fire. Potential hazards were documented using

digital tablets and field notes. NPS Pacific West Region BAER Coordinator Nelson Siefkin was consulted throughout this process to consider survey needs and mitigation options.

FINDINGS

The Caldwell Fire burned 69% of the park, and all the issues and resources identified above were relevant to some degree:

Public Safety and Resource Protection concerns:

- LABE staff identified 14 regulatory signs that were burned over and need replacement
- The primary road (10 Road) within the monument extends for 17.6 miles; of that, 7.5 miles burned on both sides of the road and 10.1 miles burned on just one side of the road. Thus, fire extends along the entire length of the 10 Road within the monument.
- Along the 2.6 miles of Medicine Lake road within the park, 0.4 miles burned on both sides and 2.2 miles burned only on the east side of the road. Like the 10 road, fire thus extends along the entire length of this road within the monument.
- Of the total trail mileage with LABE of 58 miles, 46.5 miles exist within the burn perimeter.
- Thus, all of the monument's road miles and 80% of the trail miles now have burn perimeter up to the road/trail edges, leading to a highly exposed visible landscape that will be enticing for off-road, off-trail travel by the public. Social trailing, exposed resources visible to the public, opportunities for weedy species unknowingly being transported by visitors into the burn area, etc., are now heightened concerns for sensitive resources and the monument's burned landscape.
- There are 486 documented archeological sites within the burn perimeter. Roughly 78% (n=378) of them lie within ¼ mile of a road, trail, parking area, or pullout.
- There are 546 documented lava tubes within the burned area, 17 of which are visitor use caves and another 363 (67%) of which lie within ¼ mile of trails and roads. Further analysis is recommended to understand how many are visible to the public, and to determine the level of risk from post-fire impacts or recommend protection measures.
- Fire burned along the entire 10.5 mile east NPS/FS boundary, and for the 5 miles of shared southern boundary. Although these boundaries were not surveyed by the BAER Team, seeing the extent of damage to signs throughout the rest of the monument allows for a reasonable assumption that existing

boundary signs have burned or toppled, and require replacement. Resource protection concerns noted previously within the monument are relevant here as well, along with the need to accurately identify the boundary given that hunting is allowed on FS lands and not on NPS lands.

- Some hazard trees had been identified prior to the BAER team assessment and throughout the assessments, but all known hazard trees around monument facilities have been removed by fire staff. Some hazard trees likely exist near cultural sites and cave entrances, and pose a risk to those sites, but those hazards and removal needs will be identified through separate site protection specification(s) as appropriate.

Slope Erosion concerns

- Along the Medicine Lake Road at Red Butte, slope erosion concerns appear minimal. Along most of Red Butte there is a gentle slope between the road and the slope, and a considerable amount of remaining woody debris and some unburned vegetation remain on the surface. The BARC map (Figure 4) indicates a “moderate” soil burn severity here, but at most this severity appears to be on the “low” end of moderate (similar to Caldwell Butte, discussed below).
- Per analysis by the FS soil scientists, at Devil’s Homestead/Gillem’s Bluff, rockfall hazards that have long existed here will continue to be a hazard due to the extreme topography, but the fire has not appreciably elevated that risk. Some slope movement may occur both north and south of the pullout in this area, but that risk is also not significantly elevated. The risk from rockfall will not be from rolling hazards from above so much as the possibility of a rock reaching the road and becoming a debris hazard on the roadway itself.
- Caldwell Butte: The BARC map identified “moderate” soil burn severity here, and onsite soil testing places it at most at the “low” end of moderate soil burn severity. The FS soil scientists concluded that some slope movement will occur, which in fact happened on August 11, 2020 during a rain event that dropped 0.17” of rain over a 3-hr period – some soil debris came down the slope and onto the 10 Road below. This indicates that larger rain events will bring material downslope and onto the road, perhaps for up to 3 years. They concluded that due to the lower soil burn severity, herbaceous vegetation will readily grow back on the slope; woody vegetation will likely take longer.

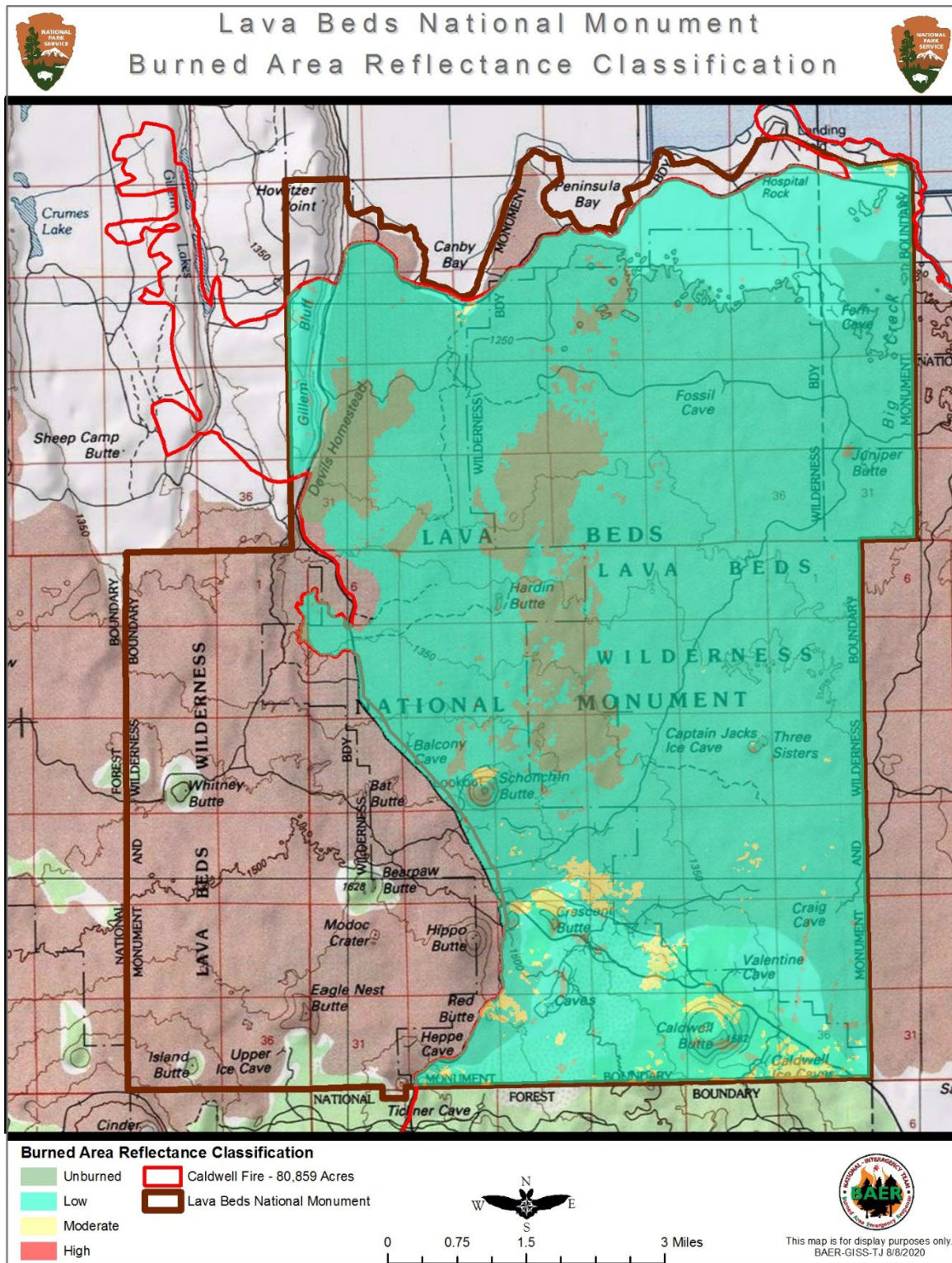


Figure 4. Burned Area Reflectance Classification (BARC) Image, Caldwell Fire



Burned Slope, Caldwell Butte

RECOMMENDATIONS

Specification-Related

Three specifications – *ES-3, Public Safety and Resource Protection*, *ES-4, Increased Agency Presence*, and *ES-5, Storm Patrols/Road Cleanup* are proposed to mitigate potential safety concerns and threats to cultural and natural resources.

ES-3, Public Safety and Resource Protection: This specification addresses the mix of public safety and sensitive resource protection concerns that the burn has created within the park. One piece of this treatment is to simply replace all the regulatory signs that were burned, in-kind. Sign materials and labor cost to install these signs are included.

The second need addressed in this specification is to purchase and install signs that clearly inform the public of specifically where they are not allowed to go within the burn area. Given all road miles and 80% of the trail miles have fire along one or both edges, the open landscape now presented to the public is a temptation that could lead to visitor safety issues and damage to sensitive cultural and natural resources. “Burned Area Closed” signs will be used, attached

to t-posts along the two monument roadways. Some road barricade signs and stands are also included where specific roads will be closed to entry. Costs detailed in the specification cover sign materials and labor to install.

Third, during the 2008-09 Jack Fire BAER implementation, an effective means of keeping the public out of the burned areas at Captain Jack's Stronghold trails was to install rope and post (stanchions) along each side of the trail to keep visitors on the trail. This same approach will be applied to the Schonchin Trail, Skull Cave pullout, Cave Loop, Valentine Cave pullout, Black Crater, Balcony Cave, and Stronghold area, in appropriate locations at each site. Stanchion posts used in the Jack Fire BAER will be reused (and more purchased), along with natural fiber rope. Costs in the specification are for materials and labor to install.

The fourth piece of this specification is to purchase and install NPS boundary marker signs along the east and southeast boundaries that are shared with the US Forest Service. The primary intent again is to protect park resources, especially during hunting season given that hunting is allowed on FS lands but not NPS lands. A mix of metal and Carsonite boundary markers will be used, depending on access and soil conditions. The specification reflects materials and labor costs to install. Standard NPS boundary markers will be used.

Finally, the fifth need addressed is to purchase four hazard warning signs that will be placed at each end of the two slope erosion areas of concern – Caldwell Butte and Devil's Homestead/Gillem's Bluff. These signs will warn drivers to be mindful of potential rock and/or debris that may have moved onto the 10 Road following rainfall events before park crews can clear the debris. This need is closely aligned to another specification (*ES-5, Storm Patrol/Road Cleanup*), but is placed here given the similar nature of the work to other pieces of this spec.

ES-4, Increased Agency Presence: It is recognized that whereas area closure signs can be effective for informing many park visitors, others will either ignore these signs or fail to understand the purpose of them. During the 2008-09 implementation of the Jack Fire BAER Plan various monument staff were utilized to be the "eyes and ears" in the field to watch for visitors illegally entering closed areas and/or posing a threat to a sensitive resource. This approach will again be taken for implementing the Caldwell Fire BAER Plan, but capitalizing on the presence of cultural resources, natural resources, interpretive, and law enforcement staff to monitor for illegal entry of visitors into the burned areas while they are going about their other fieldwork. If visitors are observed illegally entering an area, park law enforcement personnel will be notified.

Costs in the specification form are for the variety of staff from multiple divisions that will have a primary role of monitoring the burned area through law enforcement patrols and visitor

contact, educating the public about the Caldwell Fire and post-fire activities both through one-on-one contact or social media by interpretive ranger personnel, and continuing cultural and natural resource assessments related to the fire by those respective staff. See the Cultural Resource Assessment report for much more detailed information on how the Increased Agency Presence specification addresses the critical need for protecting cultural resources within the burn area.

ES-5, Storm Patrols/Road Cleanup: This specification is provided to address road cleanup needs at Caldwell Butte and Devil's Homestead/Gillem's Bluff following rainfall events. Per the findings for slope erosion within this assessment, it can be expected that debris will move downslope onto the 10 Road following precipitation events, particularly at Caldwell Butte. Costs in this specification are for labor to remove the material off the roadway and haul it away to a park-approved location. The park should identify an approved location to place the material prior to the 2020 fall rainfall events. Although it is impossible to predict how many slope movement events may occur, funding is provided for up to eight events in FY21, four events in FY22, and two events in FY23, given the expectation the slope will become stable over time as vegetation regrows.

This treatment of waiting for storm events to initiate downslope movement of material and then hauling it away is supported by the evolving understanding of successful (or unsuccessful) treatments for hillslopes following fire (Robichaud, et al, 2010), as well as by the recommendations from the two soil scientists who surveyed the Caldwell Butte site.

CONSULTATIONS

Eric Nicita, Soil Scientist, El Dorado NF

Brad Rust, Soil Scientist, July Fire Complex BAER Leader, Shasta-Trinity NF

David Hays, Chief, Integrated Resources Management, Lava Beds NM

Jessica Reid, Cultural Resource Manager, Lava Beds NM

Don Bowen, Chief, Maintenance, Lava Beds NM

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PREPARER

Jack Oelfke, Chief, Natural and Cultural Resources, North Cascades NPS Complex, WA

CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

NATURAL RESOURCES ASSESSMENT

OBJECTIVES

- Identify emergency stabilization and monitoring needs supported by specifications to aid in vegetation recovery and evaluate the potential for non-native invasive plant species to disrupt or alter recovery of vegetative communities.
- Evaluate fire impacts on sensitive bat populations, including species of concern.
- Assess changes in cave resource vulnerability to visitor impacts post fire.

ISSUES

- Vegetation:
 - Short and long-term impacts of fire and suppression activities on plant communities.
 - Latent seedbed of exotic annual species in much of the monument's burned landscape
 - Long-term dominance of sagebrush stands may preclude reestablishment of displaced forbs and bunchgrasses in former sagebrush stands, but sagebrush recruitment is also unlikely.
- Wildlife of Concern:
 - Townsend's Big-Eared Bats (*Corynorhinus townsendii*) colonies may have lost valuable foraging habitat, as well as potential changes to cave conditions due to lack of overhead vegetation.
 - Mexican Free-Tailed Bats (*Tadarida brasiliensis*) at Bat Cave may also have lost foraging habitat and are more susceptible to potential changes to in-roost conditions due to their dependence on a single cave for their summer maternity colony of ~200,000 individuals.
 - Pika living within the burned area have lost much or all of the vegetation they feed on in close proximity to block lava flows and cave refugia.
- Caves:
 - Caves previously hidden by vegetation are now more visible and may contain highly sensitive resources or serve as maternity or hibernacula roosts for critical species and be near major infrastructure or concentrated visitor use areas.

BACKGROUND

The Caldwell Fire burned approximately 70% of the park, impacting every category of natural resource within the monument – all major vegetative communities; hundreds of caves; more than a dozen different lava flows or soil types; and habitat used in various ways by every species of wildlife found in the park.

Vegetation

The total number of vascular plants documented in the monument is approximately 330 species. Lava Beds National Monument (LBE) has an existing vegetation map developed in 1979 through a master's degree completed by Dean H. Erhard. Since that survey, recent work in 2004-2006 has included a plant inventory by Sean Smith, Southern Oregon University, which provided our current total species list of 330. Lava Beds has no known federally listed plant species or potential state listed plant species within the fire perimeter. Most sensitive plant species are restricted to the southern end of the monument, on top of cinder cones.

Much of LBE is floristically equivalent to the Great Basin communities, with upper elevations transitioning into conifer forests sharing an association with the eastern slopes of the Sierras and the Southern Cascades. The vegetation types documented within the fire area include rock outcrops, sagebrush- grassland zones, western juniper woodland, and ponderosa pine forest. Lava rock outcrops are abundant throughout the fire area. These outcrops provide a variation in habitat when compared to flatter, more open grasslands and shrub steppe found in the northern half of the monument.

Due to fire suppression and intensive livestock grazing, many habitats of the monument have undergone western juniper encroachment, conversion of grasslands to shrub steppe, and overall changes to the ratios of grasses, forbs, and woody species present on the landscape prior to European settlement. The existing vegetation types exhibit these changes to varying extents, with the northern portion of the fire within the park being most influenced by livestock grazing, and associated topsoil loss and non-native weed prevalence. On a gradient generally southward and higher in elevation, fire suppression becomes the greater influence in anthropogenic divergence of vegetation communities, evidenced by the encroachment of western juniper and increased dominance of woody shrubs in grassland and sagebrush steppe. More frequent fires would have relegated larger woody plants to fire refugia, such as rocky outcrops and lava flows, in all but the highest elevation areas within the monument.

Vegetation Types

Perennial bunchgrass community occupies a large component of the northern half of the monument, generally at elevations between 4,000 and 4,500 feet above sea level. Although bluebunch wheatgrass, Thurber's needlegrass, and other native grasses are the dominant

plants in this community, there has been some incursion of woody shrubs and isolated junipers into this community over the last century. The grasslands are open, rolling country, and are generally drier than the other plant communities. Bluebunch wheatgrass (*Pseudoroegneria spicata*), Thurber's needlegrass (*Achnatherum thurberianum*), squirrel-tail (*Elymus elymoides*), phlox (*Phlox* spp.), rabbitbrush (*Chrysothamnus nauseosus* and *C. viscidiflorus*), paintbrush (*Castilleja* spp.), and mariposa lily (*Calochortus macrocarpus*) are representative species of this community.

Sagebrush Steppe community occupies the majority of the monument, generally between elevations of 4,000 to 5,000 feet above sea level. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), bitterbrush (*Purshia tridentata*), cherry (*Prunus* spp.), and rabbitbrush (*Chrysothamnus* spp.) species are the dominant shrubs in this community. The presence of mature western juniper and curl-leaf mountain-mahogany indicates patches on this landscape that have experienced fire-free intervals outside the expected range of variability (generally greater than 80+ years) and which are in need of restoration with fire (Miller et al 2003). Sagebrush steppe in the fire area often surround, or are adjacent to, rock outcrops/lava inflation zones. Species include shrubs, annual and perennial grasses and forbs. Other species of note include curl-leaf mountain-mahogany (*Cercocarpus ledifolius* var. *intermontanus*), bitter cherry (*Prunus emarginata*), choke cherry (*Prunus virginata*), Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Thurber needlegrass (*Achnatherum thurberianum*), and western needlegrass (*Achnatherum occidentale*).

Western Juniper Woodland dominates the mid-elevational burned areas of the monument from 4,500 to 6,000 feet above sea level. The understory can be sparse or absent, but usually includes most species found in the sagebrush steppe community. Mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*) can also be a strong structural component of the woodland overstory.

Lava flows are found at any elevation, and plant species partly reflect the elevation of the flow. The limited plant abundance and distribution that is observed on the flows is due in part to the nonexistent, underdeveloped, or nutrient-poor soils. Lichen and moss species are the first pioneering plants to colonize on weathered lava, with eventual emergence of grasses, forbs, and even small shrubs and trees over time. Species include Purple sage (*Salvia dorii* var. *incana*), desert ocean spray (*Holodiscus microphyllus* var. *glabrescens*), fernbush (*Chamaebatiaria millifolium*), California figwort (*Scrophularia californica*), lichens (several species), and mosses (several species).

Rock outcrops are found within the Caldwell Fire and are dominated by low shrubs, annual grasses and forbs, and other perennial species. More outcrop-dependent species include woody shrubs like gooseberry and currant (*Ribes* spp.), fernbush, and serviceberry (*Amelanchier* spp.), and forbs like several species of Penstemon.



Overview of the Northern Monument Burned Area.

Non-Native Invasive Plants

Approximately 45 species (14% of total species documented) are invasive non-native weeds. Populations of invasive species within the fire area have not been comprehensively mapped. Roadside weeds and weeds along some trails have been mapped, to some extent, for the past five summers.

Species of greatest impact at the scale of the landscape affected by the fire:

- cheat grass (*Bromus tectorum*),
- tumble mustard (*Sisymbrium altissimum*)
- common & moth mullein (*Verbascum* spp.)
- prickly lettuce (*Lactuca serriola*)
- cereal rye (*Secale cereale*)
- Canada thistle (*Cirsium arvense*)

Since the early 1990's, weed control on mullein and thistle has been conducted throughout the monument, except in the northern region of park as defined by a "control line" broadly delineating the northern quarter of the monument as an area where weed treatments would be infrequent and highly targeted. This line had to be drawn due to the high concentration of weeds in the northern section of the monument. A century of grazing by sheep and other

domestic livestock up into the mid-1970's has contributed to the presence of a number of non-native plant species. Since 2004, the monument has also been consulting with Tulelake NWR to determine the best case strategies for cereal rye, Canada thistle, and perennial pepperweed (*Lepidium latifolium*) control along the northern border, where organic farming and other practices have influenced the introduction of these species into the monument.

Wildlife of Concern

The exiting wildlife in the monument are typical of the Great Basin and dry eastern slopes of the Southern Cascades and Northern Sierras. No federally threatened or endangered species have been recorded within the park, though staff do continue to monitor two known bald eagle (*Haliaeetus leucocephalus*) nests. Staff and collaborators also actively monitor several California species of concern, including Townsend's big-eared bats.

The overall high intensity of the fire and loss of vegetation over broad swaths of the monument will have immediate and profound impacts on any resident wildlife that survived the fire event. Furthermore, survivors of the initial event may now find themselves without necessary shelter or foraging habitat. While transient or highly mobile species such as birds and large mammals may relocate to unburned areas, smaller and less mobile survivors will not fare as well. The 15 bat species identified within the monument fall within different parts of this spectrum; some are transient or forage over vast distances (Mexican free-tailed bats), others are year-round residents and forage close to their roosts with high site fidelity (Townsend's big-eared bats). Some herbivorous species depend on vegetation availability close to specific refugia to persist on the landscape, most notably the American pika (*Ochotona princeps*).

Bats

Bat management is a primary focus for the Natural Resources Management program in the monument, heightened by the advent of the White-nose Syndrome, a fungal bat disease that several of the monument's bats are susceptible to. This includes the California state-listed species of concern Townsend's big-eared bat, and other resident bats.

Townsend's big-eared bats use numerous caves within the monument within the year, including many within the burned area. There are three areas generally associated with their summer maternity colonies in the Elmer's, Cave Loop, and Caldwell cave systems; the latter two burned over with high severity impacts to surrounding vegetation. Winter hibernacula roost caves for this species are scattered more broadly in the park, and a majority are in the burned area. Both roost types are actively monitored by monument staff, with intensive annual hibernacula population counts used to monitor populations of this species. Townsend's big-eared bats are thought to generally forage near their summer roost caves and have high site affinity for these roosts.

Mexican free-tailed bats occupy a single cave in the monument, aptly named Bat Cave. It lies within a high intensity burn area of the fire. The estimated migratory population in this cave varies from 100,000 to 250,000 individuals, depending on the year and season surveyed (annual precipitation's influence on prey availability, pre/post volancy of pups, etc.) and inherent margins of error in the population estimation protocol. Of importance is the reliance of this species on a single site, its use as a maternity colony, and the effects the loss of vegetation over the cave may have on the cave's climate and suitability as a roost.

Pika

The American pika is a small, alpine member of the hare (lagomorph) family. At LABE and similar lower elevation sites where pika are found, they rely on cool temperature refugia to persist in otherwise hotter landscapes. Pika are found across the monument landscape wherever blocky lava flows and outcrops are available for use as refugia. In recent years, their use of lava tube caves has also been well documented. Annual pika surveys have generally been conducted for at least 15 years, starting with work by Dr. Erik Beever and continued by staff from the National Park Service Upper Columbia Basin I&M Network with the assistance of monument staff. Until this event, their population seems to be relatively stable.

Impacts from the Caldwell Fire may be profound on pika living within the burned area. While their temperature refugia remain largely intact within lava flows and rocky outcrops, many of these areas have been denuded of their vegetation, depriving pika of their forage. Pika create "haystacks," or food caches within their rocky domains, and some of these may have survived the burn. However, these caches are meant to sustain these animals over the winter, as they do not hibernate. Their loss or early consumption may have dire effects this winter as well.

Caves

Close to 900 caves have been documented within the monument, and 67% of these caves are within the burned area of the fire. These caves are one of the fundamental resources and values of the monument, and a primary recreation destination for visitors to the area. Caves are required habitat for several of the 15 species of bats found within the monument. Furthermore, they contain innumerable delicate geological features, unique and rare cave-dependent invertebrates and microbial communities, and support unique assemblages of vegetation at their entrances.

The 2009 Cave Management Plan defines twenty-two caves that have been developed with trails, steps, ladders, handrails, and/or walkways as Type 1 "front-country" or "visitor use caves." These caves are advertised openly to the public for their recreational and educational exploration. The remaining caves in the monument may be specifically closed due to resource protection concerns but are generally open for public exploration, if they can be located. With the landscape largely denuded of masking vegetation, many of the monument's caves that

were closed de-facto due to the difficulty involved in locating them can now be expected to encounter an exponentially greater level of visitation post-fire.



Lava Tube

RECONNAISSANCE METHODS

To rapidly assess impacts to natural resources, the five staff of the Natural Resources Program spent seven workdays on the ground collecting BAER GIS data and images of affected resources. Only three of those days included on-the-ground assessments in the backcountry or away from paved roads or trails due to hazards and policies related to travel within an uncontained fire incident. The Chief of Integrated Resource Management participated in a helicopter overflight of the fire area on the 13th of August to record landscape-scale impacts to vegetation. No visit was made to Bat Cave, but one is planned in late August. In this brief time period, frontcountry and easily accessed backcountry cave and bat resources were the primary focus.

Vegetation conditions on the Caldwell Fire were assessed through a combination of field observations by the Lava Beds Chief of Integrated Resources and satellite-derived imagery. On July 29th, 2020, Kurtis Nelson, Physical Scientist on the Wildland Fire Science Team, USGS provided a Burned Area Reflectance Classification (BARC) image by partitioning the burned area into four burn severity classes—high, moderate, low, very low/unburned. A delta Normalized

Burn Ratio (dNBR) image of the burned area was provided on August 5th, 2020 by Dianna Popp of the NPS Upper Columbia Basin I&M by comparing the changes in near and mid infrared light exhibited in pre- and post-burn Landsat images. When combined with field verification, the dNBR and BARC have demonstrable utility as indicators of post-fire vegetation mortality/condition and soil burn severity (Bobbe et al. 2003; Hudak et al. 2004), both of which have implications for vegetation recovery, potential for non-native species invasions, and impacts and threats to cultural resources (see Cultural Resources Assessment). Although no attempt was made to systematically verify the findings in the dNBR or BARC images in the field, each was used to preliminarily identify areas requiring assessments and possible treatments, with the dNBR providing the most useful visualization of burn severity.

Bat mortality and Townsend's big-eared bat maternity colony presence/absence was assessed at known locations in the visitor use caves as well as backcountry locations. No formal attempt was made to count Townsend's maternity colony populations in order to mitigate the disturbance caused by surveyors. Due to its remoteness, no assessment of the free-tailed bat colony at Bat Cave was attempted. The bald eagle nest on Boundary Butte was observed on August 12th. No observations or assessments were made regarding impacts to pika.

All visitor-use caves were assessed for bat mortality, rockfall hazard, and general cave resource conditions. Backcountry caves assessed for Townsend's maternity colony presence/absence were also given rudimentary assessments.

FINDINGS

Overall, the severity of the Caldwell Fire's impacts to the surface vegetation and wildlife of the monument is high, with large portions of the monument completely denuded of vegetation. Here, effects of the fire will be notable and persistent in the monument for many decades, or perhaps type-converted some areas to entirely different vegetative communities for the foreseeable future. Impacts on cave resources are more site-specific and largely related to the presence of sensitive species and their proximity to areas of high visitor use.

Vegetation Findings

Subjective observation by David Hays, Chief of Integrated Resource Management, both on the ground from park roads or within the Fern Cave area, and from above in a helicopter overflight, found large swaths of the monument suffered complete loss of above-ground biomass. Shrub and grassland communities fared the worst, with a mix of severities in the juniper woodland and ponderosa pine communities; some were reduced to blackened stubs, others spared.

The sagebrush community in the northeast corner of the park, which had been unburned for up to a century, was one of the most profoundly obliterated plant communities in the monument. Because those large sagebrush shrubs had crowded out most forbs and greatly reduced grasses,

the response of this area to the fire is hard to predict. If winters are snowy and sagebrush seeds survived the intensity of the fire, a sagebrush community may return. Or, if sagebrush and few other native plants fail to re-sprout or reestablish, the area may be poised to type-convert to non-native annual grasses at a massive scale. This points to a potential need for pre-emergent herbicide application and reseeding in priority areas.

The juniper woodlands of the mid-elevation areas were a mixed-severity burn, and will respond according to fire severity, proximity to previously grazed and non-native weed infested areas. Lower elevation, high-severity sites may follow the path of other low elevation areas and become dominated by non-native annual grasses, at least in the short term. Higher elevation sites should recover well, with some shrub species re-sprouting while grass and forb species become more dominant. The “old growth” juniper woodlands of the Valentine Flow, where fire may not have occurred at the landscape level in several hundred years, should still return to juniper woodland, though it will lose the complex structure of centuries-old trees.

Ponderosa pine forests of Caldwell Butte burned extremely severely during a backburning event, and much of those communities on this and Schonchin Butte have been lost. Pine species reestablishment is doubtful due to increasingly dry winters. Ponderosa forests not associated with the north aspects of volcanic buttes in the monument fared much better, with large stands along the south boundary and within the Hidden Valley topographic feature experiencing community-appropriate low to moderate fire effects.

Wildlife Findings

All three Townsend’s big-eared bat colonies were assessed, and two were located; the colony was absent from Balcony Cave, but guano in the cave looked old and the colony may have been using an entirely different cave this summer. No dead bats were encountered there, or in any other cave. Populations of the two colonies encountered were not estimated. Impacts to the Mexican free-tailed bat population at Bat Cave was not assessed due to its remote location, though an assessment and population count is currently planned for late summer or early fall, 2020. Further monitoring of bat roosts and species of concern are warranted post-fire.

During the single observation of the bald eagle nest at Boundary Butte, the snag holding the nest was observed as blackened by the fire but still standing, and an adult and a fledged juvenile were observed still using the nest and flying nearby. No assessments of pika were made. A survey is possible in the fall of 2020 with the assistance of Upper Columbia Basin Inventory and Monitoring program staff, but increased monitoring is warranted.

Cave Findings

The twenty-two visitor use caves were assessed and found to have no structural damage or rockfall hazards caused by the fire. It appears most cave resources fared well during the fire

incident. However, one profound issue was found during the assessment of the Cave Loop area, as well as other visitor-use cave areas: with obscuring vegetation removed, roughly 50-100 cave entrances are now easily found by monument visitors from popular roads and trails, if not more. While the existing Cave Management Plan allows for entry into most monument caves unless they have been specifically closed for resource protection, the obscurity of most caves had led to de-facto closing of those caves. That will no longer be the case, and many sensitive caves previously unvisited by the public are now vulnerable to visitor use impacts due to their easy discovery. Furthermore, several of these caves are closed to visitation, but now provide a tempting adventure in full view of thousands of passers-by.

These potential impacts are multiplied by the advent of ubiquitous GPS location services in cellphones, and the rapid data sharing enabled by digital platforms such as social media and Google Maps. These quickly make a cave found by one person a cave located by thousands, with the tap of a few onscreen buttons. The resulting dataset of cave locations could be shared widely among the public, creating an explosion of visitation to previously hard-to-locate, vegetation-obscured caves. These concerns may necessitate various kinds of post-fire funding for monitoring of cave resources to quantify, and potentially mitigate, visitor use and fire-related impacts.

RECOMMENDATIONS

Specification-Related

One specification described in the Public Safety and Resource Protection Assessment, *ES-3, Public Safety and Resource Protection*, includes an element that prescribes how to address post-fire natural resources issues related to a critically important cave now easily accessed by the public. Costs to implement that project are included in that specification. No other specifications are prescribed here for natural resources.

Similarly, ongoing monitoring of the natural resource concerns described in this assessment will be a part of *ES-4, Increased Agency Presence*, also described in the Public Safety and Resource Protection Assessment. Funding will be provided through that specification to monitor fire-related impacts to caves, wildlife, and vegetation, while also directing natural resource staff to serve as “eyes and ears” for illegal visitor entry into burned areas that might cause impact to sensitive cultural and natural resources.

Non-Specification

Vegetation

- Organize a meeting of ecological and botanical experts to discuss long-term planning and field work to deal with short to medium-term fire effects and BAR funding requests.

- Conduct repeat photography at photo-monitoring sites, and expanded observations of established vegetation / fire effects monitoring plots.
- Public education in the form of waysides, signage, interpretive talks, social media posts, etc. that will be an important part of educating the public about the role of wildland fire in monument ecosystem, and the continued reduction and control of invasive species after the Caldwell Fire.
- Create a Vegetation Management Plan to provide comprehensive guidance for post-fire vegetation management in the monument for the next decade or more.

Wildlife

- Public education in the form of waysides, signage, interpretive talks, social media posts, etc. to inform the public about how wildlife is responding to the impacts of the Caldwell Fire.
- Lava Beds provides important habitat for 15 bat species, including the cave-obligate Townsend's big-eared bat. Little is known about post-fire ecological impacts on cave dwelling bat species, and further study is recommended to inform future fire management decisions. In particular, research focused on impacts to foraging ability, maternity and hibernacula cave usage, and landscape-scale species richness is recommended to provide a better-informed approach toward prescribed burns and post-fire restoration efforts in a volcanic landscape.

Caves

- Little is known about post-fire effects on lava tubes. The following recommendations would add to the body of knowledge related to impacts from wildland fire on cave resources.
 - Research is needed to monitor microbial communities and invertebrate species within caves, many of which are unique to the cave environment.
 - Drip water and aerosol studies would aid in understanding nutrient input into the caves that have burned over. Aerosol studies would also determine the presence or absence of airborne microbes. Past research has been done on LABE lava tube surface microbes and on drip water. These studies stand as baseline data which aid in understand post-fire research findings. Post-fire and long-term sampling will aid in understanding the effects of fire and what concerns may or may not exist for future fire treatments and post-fire activities.
 - Ice caves with entrances exposed by the fire may have ice deposits impacted by unauthorized visitation during spring and summer melt out periods. At risk is the record found in ice cores that may indicate climatic changes, pollen, and cultural resources that may melt out.

- New cave entrances exposed by fire should be documented. Inventory and monitoring in caves that are currently off-limits due to post fire safety concerns should be continued. These activities can be conducted in a timely manner with the assistance of trained volunteers such as members of the Cave Research Foundation and the National Speleology Society.
- Develop an updated Cave Management Plan to ensure caves are managed in a manner appropriate to the monument's new landscape conditions and responsive to the potential impacts of digital platforms and data sharing not prevalent when the last plan was written.

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CONSULTATIONS

Calvin Farris, Fire Ecologist, Network Staff, National Park Service

David Larson, Superintendent, Ft. Davis National Historic Site

Nelson Siefkin, BAER coordinator, Pacific West Region, National Park Services

Tom Rodhouse, Ecologist, NPS Upper Columbia Basin Network I&M Program

Ted Weller, USDA Pacific Research Center, U.S. Forest Service

Kerry Johnston, Botanist, BLM Klamath Falls Resource Area

PREPARER(S)

David Hays, Chief of Integrated Resources, Lava Beds National Monument

Patricia Seiser, Physical Scientist, Lava Beds National Monument

CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

CULTURAL RESOURCES ASSESSMENT

OBJECTIVES

- Meet all Federal cultural resources legal mandates, including consultation with appropriate American Indian Tribes and with the State Historic Preservation Officer.
- Determine if documented or incidentally encountered cultural resources within or adjacent to the Caldwell Fire burned areas were impacted by the fire and/or are threatened by post-fire conditions. If applicable, propose emergency stabilization treatments or activities to minimize or reduce those impacts.
- Determine if any proposed emergency stabilization treatments on the Caldwell Fire, particularly those associated with public closures, might adversely impact cultural resources and take measures to prevent those impacts.
- Determine if any of the potential museum collections objects that were stored in the Conex in the park maintenance storage yard that were burned in the Caldwell Fire can be salvaged and recommend conservation treatments to address those objects.

ISSUES

- [REDACTED]

[REDACTED]

BACKGROUND

Introduction

This cultural resource assessment was completed to ascertain the degree to which the Caldwell Fire has impacted known cultural resources and to determine if post fire conditions pose a risk to cultural resource values. Identification of these values at risk included completing a cultural resources data records search for the fire area to identify those resources located within the burned area and conduct field resource assessments to determine existing impacts and threats.

Cultural resources are “Those parts of the physical environment – natural and built – that have cultural value of some kind to some socio-cultural group”, with “group” referring to more or less distinctive entities such as communities, neighborhoods, tribes, and even scientific disciplines (for example, archeologists) (King 2004:12). Cultural resources are also “nonmaterial human social institutions that contribute so much to the ‘environment in our heads’ – our social institutions, our beliefs, our accustomed practices, and our perception of what makes the environment socially comfortable” (King 2004:13). In other words, cultural resources include all cultural groups with ancestral, personal, or professional connections to them. The National Park Service (NPS) divides cultural resources into five non-exclusive categories: archeological resources, structures, cultural landscapes, ethnographic resources, and museum objects.

Archeological resources are the physical evidences of past human activity, including evidences of the effects of that activity on the environment, and are frequently conceptualized and managed as spatially discrete archeological sites. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

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CONSULTATIONS

Perry Chocktoot, Director of the Department of Culture and Heritage, The Klamath Tribes
Les Anderson, Site Protection Specialist, Department of Culture and Heritage, The Klamath Tribes

Bill Follis, Chief, The Modoc Nation

PREPARER(S)

Joe Svinarich, Klamath Network Fire Archeologist, Whiskeytown National Recreation Area
Jessica Reid, Cultural Resources Program Manager, Lava Beds National Monument and Tule
Lake National Monument

CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

MINOR FACILITIES ASSESSMENT

OBJECTIVES

- Identify and assess minor facilities, including trails, that have burned within the fire perimeter.

ISSUES

- The Caldwell Fire burned many minor facilities on NPS lands. These facilities serve park visitors in the campground (picnic tables, informational signs), along park roads and at pullouts throughout the park (information signs), and along park trails and trailheads (information signs, benches, and the trails themselves). Such facilities similarly provide for resource protection by directing visitors to appropriate places and describe appropriate visitor behavior (“no dogs”; “cave lightly”, etc.).

BACKGROUND

DOI policy for Burned Area Rehabilitation (BAR) issues allows for the repair or replacement of minor improvements and facilities that have burned within a fire. At Lava Beds National Monument (LBNM) minor facilities burned in the Caldwell Fire include, but are not limited to, informational signs and kiosks at trailheads, roadsides, and road pullouts; resting benches along trails; and picnic tables, site signposts, and amphitheatre facilities in the Indian Well Campground. Most of these facilities were constructed of wood (many of them from redwood), although plastics-based facilities also were burned. Some of the picnic tables in the campground are CCC-era and are cultural resources. Reference the Cultural Resources Assessment for more context on those tables.

Minor facilities are located throughout the park but primarily along roads that provide for visitor access. Some wooden trail signs are in the backcountry along trails, typically at important trail junctions to direct trail users.

The park also has 58 miles of maintained hiking trails for visitor use. Trails provide not only visitor access to different features of the park but also serve as an excellent resource protection measure by generally confining visitors to the linear corridor of the trail itself.

Note that some facilities, such as regulatory signs (stop signs, speed limit signs, etc.), signs used to keep people out of the burn area, and signs to protect critical resources are considered vital

to public safety or resource protection and are considered separately, in the Public Safety and Resource Protection Assessment.

RECONNAISSANCE METHODS

Assessments of locations within the fire perimeter that had minor facilities potentially burned was accomplished in multiple ways, including:

- Prior to the arrival of the BAER Team (August 5th) park maintenance staff had quickly scouted most frontcountry facilities and had a general idea of where burn impacts had occurred. That knowledge enabled a focused BAER assessment by the BAER team.
- An assessment of regulatory signs that had burned was completed by park staff prior to the arrival of the BAER Team, and that information was provided to the BAER Team (and accounted for and a treatment specification written under the Public Safety and Resource Protection Assessment).
- On August 7-8 park maintenance staff accompanied the BAER Team Leader to formally assess burned minor facilities. Park staff included Melvin Llewellyn, David Bond, and Romero Cobian. All frontcountry facilities were surveyed.
- On separate occasions the BAER Team Leader surveyed the Schonchin Butte Trail (August 8th); Thomas-Wright Battlefield Trail (August 11th); Caldwell Trail (August 13th), and the Bunchgrass Trail (August 14th) for potential burn impacts as a representative assessment for trails, particularly those that had some slope to them that might be vulnerable to erosion following rain events. Time did not permit an assessment of all park trails, but a park GIS trails layer enabled a count of wooden signs within the burn in the more distant backcountry locations.
- The BAER Team Leader met with park Facility Services Assistant Jana Gonzalez and Klamath Network FMSS Specialist Nancy Conforti on August 10th to obtain cost estimates for repair or replacement of burned facilities that qualify for BAR funding. That information provided the basis for development of the specification(s) within this assessment.

FINDINGS

The table below indicates where burned minor facilities were located and generally what the burned facility or asset included. As noted above, the inventory of burned regulatory signs is accounted for in the Public Safety and Resource Protection Assessment, and costs included in the *ES-3 Public Safety and Resource Protection* specification.



Fire Damaged CCC Picnic Table

<i>Location</i>	<i>Facilities or Asset Burned/Damaged</i>
Various locations throughout park	Wooden informational signs at trailheads; pullouts and roadsides along the road
Indian Well Campground	CCC historic picnic tables; non-historic picnic tables; site markers; amphitheatre benches; siding on amphitheatre; electric panel; informational signs
Various locations throughout park	Metal/Carsonite informational signs, typically informing visitors on “no dogs”, “cave softly”, etc.
Schonchin Butte Trail	Interpretive bulletin board at trailhead; wooden benches along trail
Gillem’s Bluff	Wildland Fire Danger sign



Schonchin Butte Trailhead Bulletin Board

Trails:

Of the park total trail mileage of 58 miles, 46.5 miles exist within the burn perimeter.

As noted, only a small subset of trails was able to be surveyed during the BAER Team assessment. The BAER Team Leader surveyed the following trails and noted the following:

Schonchin Butte Trail: Burned bulletin board at trailhead, which includes public safety information; both wooden benches along the trail burned. There are no drains/waterbars on this trail, but with burned slopes above the entire trail there may be erosional events and subsequent material on the trail following rain events.

Thomas-Wright Battlefield Trail: No damage from the fire along this trail. Several small rock walls exist that hold the trail in place in several locations, but none appeared to suffer any damage.

Caldwell Trail: Only the lower ½ mile of trail was accessed, but several drains exist along this road-turned-to-trail segment. Rainfall from the August 11th thunderstorm caused material to flow down the trail, often overtopping the drains that exist. All these drains need to be cleaned ahead of the fall rain season or erosional damage will occur to this trail.

Bunchgrass Trail: There are 20 drains on this trail, all within the first ½ mile of trail from the Bunchgrass pullout on the 10 Road. These drains all need to be cleaned ahead of the fall rain season to prevent erosional damage to the trail.

The park GIS layer for trails indicates seven signs in the backcountry. All occur within the burn perimeter, and all should be assumed to need replacement.

RECOMMENDATIONS

Specification-Related:

Two specifications are recommended to address the repair/replacement of burned facilities within the Caldwell Fire. *BAR-1, Repair/Replace Minor Facilities* and *BAR-2, Increased Trail Maintenance* are proposed to mitigate the effects of the fire on park trails and infrastructure impacted by the fire.

BAR-1, Repair/Replace Minor Facilities

This specification identifies funding needs to repair or replace those facilities burned in the Caldwell Fire that are not emergency or life/safety related, but are critical facilities that serve the visiting public. Many facilities in the Indian Well Campground burned and need replacement; wooden informational signs throughout the park within the burn area, typically made of redwood and reflecting a park aesthetic unique to LABE, all need replacement; and other similar burned facilities require repair or replacement. Costs identified in this specification come from the CESS estimates from the park FMSS database. Signs will either be manufactured in-house by park staff or purchased locally (metal signs, posts, etc.). Labor costs are for park maintenance staff. Note that the CCC-era picnic tables in the campground will be repaired by park staff, and Section 106 cultural compliance will be needed before that work can begin.

BAR-2, Increased Trail Maintenance

This specification identifies funding needs for expected increased trail maintenance needs for the coming 1-3 years following the fire. Over 46 of the 58 trail miles in the park burned over. Experience has shown that trail erosion, windfall of burned trees, and damage to trail tread due to the collapse of burned out roots all increase in the first few years post-fire. Costs identified for this specification are to bring experienced trail crew workers from Crater Lake National Park or similar assistance to provide an experienced, focused crew to complete the work, for perhaps one payperiod in the spring and one payperiod in the fall. Work will typically focus on cleaning drains and/or constructing drains if needed, removing windfall, etc.

CONSULTATIONS

Don Bowen, Chief of Maintenance, Lava Beds NM

Garry Wedmore - Maintenance Supervisor, Lava Beds NM

Melvin Llewellyn - Maintenance Mechanic, Lava Beds NM

David Bond - Maintenance worker, Lava Beds NM

Romero Cobian - Maintenance worker, Lava Beds NM

Nancy Conforti - Facility Management System Specialist, Klamath Basin Network

Jana Gonzalez, Facility Service Assistant, Lava Beds NM

PREPARER

Jack Oelfke, BAER Team Leader, North Cascades National Park Service Complex, WA



Wildland fire danger sign

CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

SPECIFICATIONS



Lava Beds National Monument – Campground Area

PART F - INDIVIDUAL SPECIFICATIONS

TREATMENT/ACTIVITY NAME	BAER Plan Preparation	PART E SPECIFICATION #	ES 1
NFPORS TREATMENT CATEGORY*	Planning	FISCAL YEAR(S) (list each year):	2020
NFPORS TREATMENT TYPE*	ES/BAER Plan	WUI? Y/N	N
IMPACTED COMMUNITIES AT RISK	NA	IMPACTED T&E SPECIES	NA

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

General Description: This specification finances personnel, travel and other costs associated with developing the Caldwell Fire Burned Area Emergency Response and Burned Area Rehabilitation Plan, including field assessments, coordination and administration, writing, map preparation and data management.

Location/ (Suitable) Sites: Caldwell Fire, Lava Beds National Monument, California

Design/Construction Specifications: The plan was prepared in accordance with DOI, NPS, and interagency Burned Area Emergency Response and Burned Area Rehabilitation policy and guidance, including:

- (1) Office of Wildland Fire (OWF) Policy Memorandum 2016-01 (Post-Wildfire Recovery Program and Policy Changes)
- (2) Interagency Standards for Fire and Fire Aviation Operations, 2020
- (3) NPS Reference Manual 18 (Chapter 18)
- (4) NPS Wildland Fire & Aviation Management Business Rules, FY20
- (5) Interagency Burned Area Emergency Response Guidebook (Version 4.0)
- (6) Interagency Burned Area Rehabilitation Guidebook (Version 1.3)

Purpose of Treatment Specifications (relate to damage/change caused by fire): The plan was prepared to meet DOI and NPS policy requirements.

Treatment Reasonableness and Cost Effectiveness: N/A

Treatment Effectiveness Monitoring Proposed: N/A

Treatment consistent with Agency Land Management Plan (identify which plan): N/A

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).		QUANTITY	UNIT PRICE	AMOUNT
+ -	NOTE: GRADES AND COST/HOUR AVAILABLE UPON REQUEST			
+ -	National BAER Team (Oelfke, Svinarich)	1	\$32,244.00	\$32,244.00
+ -	NPS Cultural Resource Staff (Reid,Combett, Watry, Diacamos, Ricci, Curtis)	1	\$6,404.00	\$6,404.00
+ -	NPS Natural Resource Staff (Hays, Murray, Pierce, Stuphin, Hoffman, Seiser)	1	\$3,448.00	\$3,448.00
+ -	NPS Visitor & Resource Protection Staff (Smith, Ek, Dunn, Lechleiter)	1	\$3,867.00	\$3,867.00
+ -	NPS Maintenance Staff (Bowen, Conforti, Wedmore, Cobian, Bond, Meluen)	1	\$2,398.00	\$2,398.00
TOTAL PERSONNEL SERVICE COSTS				\$48,361.00
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.		QUANTITY	UNIT PRICE	AMOUNT
+ -	N/A	0		\$0.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COSTS				\$0.00

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -	N/A	0		\$0.00
TOTAL MATERIALS AND SUPPLY COSTS				\$0.00
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -	Oelfke, Svinarich	1	\$2,312.00	\$2,312.00
TOTAL TRAVEL COSTS				\$2,312.00
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -	N/A	0		\$0.00
TOTAL CONTRACT COSTS				\$0.00

SPECIFICATION COST SUMMARY

	FISCAL YEAR	PLANNED INITIATION DATE	PLANNED COMPLETION DATE	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COSTS
+ -	2020	08/05/2020	08/30/2020	F	Plan	\$50,673.00	1	\$50,673.00
	SUMMARY COST TOTAL							\$50,673.00
	Difference should be zero (SUMMARY COST TOTAL - SPECIFICATION TOTAL)							\$0.00
	SPECIFICATION TOTAL							\$50,673.00

Work Agent C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
2.	Documented cost figures from similar project work obtained from local agency sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
3.	Estimate supported by cost guides from independent sources or other federal agencies	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
4.	Estimates based upon government wage rates and material cost.	☒ P ☐ E ☐ M ☒ T ☐ C ☐ F
5.	No cost estimate required - cost charged to Fire Suppression Account	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT

PART F - INDIVIDUAL SPECIFICATIONS

TREATMENT/ACTIVITY NAME	Implementation Leader	PART E SPECIFICATION #	ES 2
NFPORS TREATMENT CATEGORY*	Administration	FISCAL YEAR(S) (list each year):	2021, 2022, 2023
NFPORS TREATMENT TYPE*	Administration	WUI? Y/N	N
IMPACTED COMMUNITIES AT RISK	NA	IMPACTED T&E SPECIES	NA

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

General Description: This specification will fund salary, travel and miscellaneous expenses for personnel responsible for overseeing implementation of proposed BAER treatments and activities associated with the Caldwell Fire in FY21, FY22 and FY23, as applicable. Funding is also requested for administrative support.

Location/ (Suitable) Sites: Caldwell Fire, Lava Beds National Monument, California

Design/Construction Specifications: Among the tasks to be performed under this specification include (as applicable):

- (1) Develop and amend specifications
- (2) Develop scopes of work
- (3) COTR
- (4) Interagency coordination
- (5) Implementation monitoring
- (6) Budget tracking
- (7) Communication and education
- (8) Accomplishment reporting
- (9) Environmental compliance

Purpose of Treatment Specifications (relate to damage/change caused by fire): The Caldwell Fire created a variety of emergency post-fire issues on NPS lands. Multiple specifications are proposed to address these issues, most of which require specialized expertise provided by LABE staff or cooperators. Dedicated overhead implementation staff time is required to ensure specifications are completed correctly and in a timely manner, budgets are tracked, and accomplishments are reported.

Treatment Reasonableness and Cost Effectiveness: N/A

Treatment Effectiveness Monitoring Proposed: N/A

Treatment consistent with Agency Land Management Plan (identify which plan): Lava Beds National Monument General Management Plan (2011); Lava Beds National Monument Fire Management Plan

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).		QUANTITY	UNIT PRICE	AMOUNT
+ -	FY21 Implementation Leader FY20 GS-12 Step 5 Base Salary \$40/hr. X 80 hrs./PP X 10 PP	1	\$32,000.00	\$32,000.00
+ -	FY22 Implementation Leader FY21 GS-12 Step 5 Base Salary \$40/hr. X 80 hrs./PP X 5 PP	1	\$16,000.00	\$16,000.00
+ -	FY23 Implementation Leader FY22 GS-12 Step 5 Base Salary \$40/hr. X 80 hrs./PP X 5 PP	1	\$16,000.00	\$16,000.00
+ -	FY21 Administrative Assistant FY20 GS-	1		\$0.00
+ -	FY22 Administrative Assistant FY20 GS-	1		\$0.00
+ -	FY23 Administrative Assistant FY20 GS-	1		\$0.00
TOTAL PERSONNEL SERVICE COSTS				\$64,000.00

EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.		QUANTITY	UNIT PRICE	AMOUNT
+ -	FY21 Vehicle @ \$600/month X 5 months	1	\$3,000.00	\$3,000.00
+ -	FY22 Vehicle @ \$600/month X 2 months	1	\$1,200.00	\$1,200.00
+ -	FY23 Vehicle @ \$600/month X 2 months	1	\$1,200.00	\$1,200.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COSTS				\$5,400.00
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -	N/A	0		\$0.00
TOTAL MATERIALS AND SUPPLY COSTS				\$0.00
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -	N/A	0		\$0.00
TOTAL TRAVEL COSTS				\$0.00
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -	N/A	0		\$0.00
TOTAL CONTRACT COSTS				\$0.00

SPECIFICATION COST SUMMARY

	FISCAL YEAR	PLANNED INITIATION DATE	PLANNED COMPLETION DATE	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COSTS
+ -	2021	10/01/2020	09/30/2021	F	N/A			
+ -	2022	10/01/2021	09/30/2022	F	N/A			
+ -	2023	10/01/2022	09/30/2023	F	N/A			
	SUMMARY COST TOTAL							
	Difference should be zero (SUMMARY COST TOTAL - SPECIFICATION TOTAL)							(\$69,400.00)
	SPECIFICATION TOTAL							\$69,400.00

Work Agent C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
2.	Documented cost figures from similar project work obtained from local agency sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F

3.	Estimate supported by cost guides from independent sources or other federal agencies	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
4.	Estimates based upon government wage rates and material cost.	☒ P ☒ E ☐ M ☐ T ☐ C ☐ F
5.	No cost estimate required - cost charged to Fire Suppression Account	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT

PART F - INDIVIDUAL SPECIFICATIONS

TREATMENT/ACTIVITY NAME	Public Safety and Resource Protection	PART E SPECIFICATION #	ES-3
NFPORS TREATMENT CATEGORY*	Human Life and Safety	FISCAL YEAR(S) (list each year):	FY20, FY21
NFPORS TREATMENT TYPE*	Replace Signs	WUI? Y/N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

General Description: This treatment is for the repair/replacement of regulatory signs and NPS boundary signs; installation of Burned Area Closed signs; road hazard warning signs; rope and stanchion barriers, and a cave gate. The regulatory signs provide for safe driving along park roads; boundary signs provide for resource protection, particularly for showing where activities such as hunting are allowed (FS side of boundary) and not allowed (NPS side of boundary). Burned Area Closed signs will prevent visitors for entering into the burned area to keep them away from sensitive cultural and natural resource and to provide for their safety in the now burned environment. Rockfall/debris warning signs are for driver protection along the 10 road. Rope and stanchion barriers will keep visitors away from sensitive features within the burned area at popular visitor locations. Finally, the cave gate will protect a sensitive natural resource that has become exposed due to loss of vegetation around the opening of the cave.

Location/ (Suitable) Sites: throughout the entire park - see Public Safety and Resource Protection assessment.

Design/Construction Specifications: Signs will be installed in locations that best protect sensitive natural and cultural resources and keep visitors out of the burned area. Road hazard signs will be installed in two locations that may experience downslope movement of soil and rocks. Rope and stanchion barriers will be installed at identified locations where keeping visitors confined to trails and specific roadside locations will best protect sensitive resources from visitor impacts. The cave gate will be constructed according to industry standards that allows passage of bats while keeping humans out.

Purpose of Treatment Specifications (relate to damage/change caused by fire): In all cases, to either protect visitors from hazards created by the Caldwell Fire on the park landscape and/or to protect sensitive cultural and natural resources in the burn perimeter.

Treatment Reasonableness and Cost Effectiveness: All costs are generated by the CESS cost estimating program and/or using NPS staff.

Treatment Effectiveness Monitoring Proposed: The project implementation leader will conduct field checks and park supervisors will similarly check field work to ensure work quality.

Treatment consistent with Agency Land Management Plan (identify which plan): Foundation Document (2017)

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).		QUANTITY	UNIT PRICE	AMOUNT
+ -	Regulatory Signs Labor: 2 Maintenance Workers, WG-5 @ \$23/hr x 80 hrs = \$3680 -- FY20	1	\$3,680.00	\$3,680.00
+ -	Burned Area Signs Labor: 2 Maintenance Workers, WG-5 @ \$23 /hr x 27 hrs = \$1242 --FY20	1	\$1,242.00	\$1,242.00
+ -	Rope & Stanchion Barrier Labor: Maintenance Workers, WG-5 @ \$23/hr x 80 hrs = \$3680 -- FY20	1	\$3,680.00	\$3,680.00
+ -	Boundary Signs Labor: Maintenance Workers, WG-5 @ \$23/hr x 80 hrs = \$3680 -- FY20	1	\$3,680.00	\$3,680.00
+ -	Boundary Signs Labor: Maintenance Workers, WG-5 @ \$23/hr x 80 hrs = \$3680 -- FY21	1	\$3,680.00	\$3,680.00
+ -	Cave gate Labor – GS-9 \$27.88/hr x 40 hrs = \$1115 -- FY20	1	\$1,115.00	\$1,115.00
+ -	Cave gate labor - WG-9 \$44.53/hr x40 hrs = \$1781 -- FY20	1	\$1,781.00	\$1,781.00
+ -	Cave gate labor - WG-8 \$29/hr x 40 hrs = \$1160 -- FY20	1	\$1,160.00	\$1,160.00
+ -	Cave gate labor – 2 WG-5 @ \$23/hr x 40 hrs = \$1840 -- FY20	1	\$1,840.00	\$1,840.00
TOTAL PERSONNEL SERVICE COSTS				\$21,858.00
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.		QUANTITY	UNIT PRICE	AMOUNT
+ -	Burned Area Closure project – GSA Vehicle (Maintenance) @ \$53.75/day X 4 -- FY20	4	\$53.75	\$215.00
+ -	Boundary Sign – Vehicle @ \$600/month X 1 -- FY20	1	\$600.00	\$600.00
+ -	Boundary Sign – Vehicle @\$600/month X 1 -- FY21	1	\$600.00	\$600.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COSTS				\$1,415.00

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -	Burned Area Closure posts @ \$7.88 /each X 100	100	\$7.88	\$788.00
+ -	Burned Area Closure signs @ \$20.00 /each X 100	250	\$20.00	\$5,000.00
+ -	Burned Area Closure Zip Ties @ \$2.29/ea	1,000	\$2.29	\$2,290.00
+ -	Burned Area Gate Closed signs @ \$65.00/each X 2	2	\$65.00	\$130.00
+ -	Burned Area Hazard signs @ \$65.00/each X 6	6	\$65.00	\$390.00
+ -	Rope & Stanchion Barrier rope @ \$2.00/foot X 2,000	2,000	\$2.00	\$4,000.00
+ -	Rope & Stanchion Barrier posts @ \$16.66/each X 150	150	\$16.66	\$2,499.00
+ -	Regulatory Signs @ \$77.00/each X 14	14	\$77.00	\$1,078.00
+ -	Regulatory Sign Posts @ \$23.53/each X 24	24	\$23.53	\$564.72
+ -	Area Closure Barricade ACade @ \$79.45/each X 6	6	\$79.45	\$476.70
+ -	Area Closure Barricade Plastic @ \$37.97/each X 14	14	\$37.97	\$531.58
+ -	Area Closure Traffic Cones @ \$9.75/each X 20	20	\$9.75	\$195.00
+ -	Boundary Sign T-Posts @ \$8.00/each X 90	90	\$8.00	\$720.00
+ -	Carsonite Signs @\$ 26.45/each X 90	90	\$26.45	\$2,380.50
+ -	Cave Gate: angle iron, welding supplies	1	\$6,000.00	\$6,000.00
+ -				
TOTAL MATERIALS AND SUPPLY COSTS				\$27,043.50
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -				
TOTAL TRAVEL COSTS				

CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -				
TOTAL CONTRACT COSTS				

SPECIFICATION COST SUMMARY

	FISCAL YEAR	PLANNED INITIATION DATE	PLANNED COMPLETION DATE	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COSTS
+ -	20	08/15/2020	09/30/2020	F	ea	\$41,733.00	1	\$41,733.00
+ -	21	10/01/2020	11/30/2020	F	ea	\$8,584.00	1	\$8,584.00
	SUMMARY COST TOTAL							\$50,317.00
	Difference should be zero (SUMMARY COST TOTAL - SPECIFICATION TOTAL)							\$0.50
	SPECIFICATION TOTAL							\$50,316.50

Work Agent C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
2.	Documented cost figures from similar project work obtained from local agency sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
3.	Estimate supported by cost guides from independent sources or other federal agencies	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
4.	Estimates based upon government wage rates and material cost.	☒ P ☒ E ☒ M ☐ T ☐ C ☐ F
5.	No cost estimate required - cost charged to Fire Suppression Account	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT

PART F - INDIVIDUAL SPECIFICATIONS

TREATMENT/ACTIVITY NAME	Increased Agency Presence	PART E SPECIFICATION #	ES-4
NFPORS TREATMENT CATEGORY*	Monitoring	FISCAL YEAR(S) (list each year):	2020, 2021
NFPORS TREATMENT TYPE*	Treatment Effectiveness Monitoring	WUI? Y/N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	None

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

General Description:With 70% of the park burned and access by visitors into the highly visible landscape a serious threat to cultural and natural resources, as well as a concern for visitor safety in the burned area, increased agency presence will enable multiple park employees to be "eyes and ears" to ensure illegal or inappropriate visitor activities are not occurring and visitors remain safe. Several Lava Beds employees across multiple divisions will be funded fully or partially in FY20 and FY21 to accomplish a variety of tasks geared toward documenting resource/site concerns from the fire, monitoring resources within the burned area, and reporting any impacts/visitor activities that require immediate response. Park staff will also provide important fire information to visitors and engage with park visitors about the fire and post-fire mitigations on an ongoing basis. Specifically:

1) Staff in cultural resources will accomplish this objective through their presence in sensitive and visible burned areas while conducting assessments at documented archeological sites, and while traversing the landscape moving from site to site. 2) Seasonal Law Enforcement personnel will conduct increased patrols of monument roads and trails within the burned areas, targeting locations that contain sensitive and vulnerable resources. 3) Staff in natural resources will accomplish this objective while assessing cave entrances and traversing across the landscape. 4) Interpretive staff will provide roaming patrols/interaction directly with park visitors at key locations, as well as create social media that will reach literally 10s of thousands of park visitors and supporters. 5) A Museum Specialist is needed to assess damage to collections that were burned/scorched in the fire. 6) Section 106 Cultural Compliance is also necessary for various implementation projects, and the park Archeologist is funded for 2 PP below as part of his overall funding request for FY21. 7) Travel for a member of the Modoc Nation in Oklahoma is necessary to enable consultation on the BAER plan and specific cultural sites/concerns, and a Tribal Monitor will assist NPS staff in cultural assessments in the park.

Location/ (Suitable) Sites:Within and around the Caldwell Fire burned area, with increased efforts in locations containing vulnerable resources and higher visitor use areas; via social media on park Facebook, Instagram, and related sites. Specific to cultural resource assessments: 1) Documented archeological sites within the Caldwell Fire burned area categorized as "high priority" or "medium priority" in easily accessible locations relative to post-fire threats, including looting/vandalism and destabilization due to vegetation loss. At least 50% of these cultural resources will be assessed. 2) The Modoc War Historic District cultural landscape. 3) All museum collection objects located in the Connex in the park 'bone yard'.

Design/Construction Specifications:Staff will work within the Caldwell Fire burned area, monitoring documented cultural resources and natural resources for condition change, tracking visitor use patterns, completing daily patrols, and engaging with park visitors. All staff employees funded by this specification will have a specific requirement to watch for illegal visitor entry into burned areas and promptly report such activity to LE staff following an established protocol. Besides existing NPS employees, work will include at least one member of The Klamath Tribes, employed to provide field assistance and serve as a Native American monitor. NPS employees in a variety of cultural resources disciplines will be involved, and all will meet DOI, Secretary of the Interiors Professional Qualifications for their discipline.

Purpose of Treatment Specifications (relate to damage/change caused by fire):Increased agency presence has proven to be an effective tool for deterring illegal activities within burned areas in other park units, and in the past at Lava Beds. The extreme significance of cultural resources within the burned area as measured by importance to contemporary members of The Klamath Tribes and the Modoc Nation, association with important events in American history, association with significant historic architectural styles, and information potential regarding those events justifies the need for increased agency presence. Similarly, caves and wildlife resources dependent on caves are also vulnerable to illegal entry/activities and will be well-served by increased agency presence as staff target specific vulnerable areas and while doing necessary site monitoring.

Treatment Reasonableness and Cost Effectiveness:

By utilizing NPS staff that are funded through other specifications or fund sources, these employees can aid the usual Law Enforcement function and be the eyes and ears for resource protection.

Treatment Effectiveness Monitoring Proposed:Effectiveness will be measured based on the success of increased agency presence at reducing visitor related impacts to critical cultural and natural resources. This will be accomplished through continuous monitoring of visitor use patterns, evaluation of changing conditions at cultural resource sites, and coordination with law enforcement.

Treatment consistent with Agency Land Management Plan (identify which plan):LABE Fire Mgmt Plan revision (2017); LABE Foundation Document, (2017)

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).		QUANTITY	UNIT PRICE	AMOUNT
+ -	VRP Staff: Career Seasonal LE (GL-9/1, \$44.19/hr, 16hrs/pp, 8PP FY21	1	\$5,656.00	\$5,656.00
+ -	VRP Staff: Career Seasonal LE (GL-9/4 \$43.10/hr, 16hrs/pp, 8PP FY21	1	\$5,520.00	\$5,520.00
+ -	VRP Staff: Forestry Tech (GS-5/1, \$21/hr, 1PP FY21	1	\$1,680.00	\$1,680.00
+ -	VRP staff: seasonal LE, (GL 7/5, \$1850/PP, 2.5 PP = \$4625) --FY20	1	\$4,625.00	\$4,625.00
+ -	VRP staff: seasonal LE, (GL 7/5, \$1850/PP, 8.5 PP = \$15,725) --FY21	1	\$15,725.00	\$15,725.00
+ -	VRP staff: Career Seasonal LE (GL 9/1, \$44.19/hr, 8 hrs/PP, 11 PP = \$3890) --FY21	1	\$3,890.00	\$3,890.00
+ -	VRP staff: Career Seasonal LE (GL 9/1, \$43.10/hr, 8 hrs/PP, 11 PP = \$3890) --FY21	1	\$3,795.00	\$3,795.00
+ -	VRP staff: Detailer LE - Dunn (GL 9/1, \$60.90/hr reg.(40 hrs), \$63.44 OT (37hrs) = \$4785 --FY20	1	\$4,785.00	\$4,785.00
+ -	VRP staff: Detailer LE - Warmerdam (GL 9, \$61.84 reg (80 hrs), \$61.85 OT (74 hrs) = \$ 9524 --FY20	1	\$9,524.00	\$9,524.00
+ -	VRP Staff: Detailer - LE (GL-9/10, \$61.84 reg (40 hrs), \$61.85 OT (74 hours)	1	\$9,767.00	\$9,767.00
+ -	CR staff: Archaeologist (Curtis) GS-9, 20 hours @ \$41.82/hr = \$836 -- FY20	1	\$836.00	\$836.00
+ -	CR staff: Museum Specialist, (GS-11/1, 40 hrs @ \$46.16/hr = \$1850) -- FY20	1	\$1,850.00	\$1,850.00
+ -	CR staff: seasonal (GS-5/1, 20 hours OT @ \$27/hr = \$540 --- FY20	3	\$540.00	\$1,620.00
+ -	CR Staff: Combel, GS-7/1, 20 hours OT @ \$33.47/hr = \$670 --- FY20	1	\$670.00	\$670.00
+ -	CR staff: Archaeologist (Curtis) GS-9, 6 PP @ \$3346/PP = \$20,076 -- FY21	1	\$20,076.00	\$20,076.00
+ -	CR staff: seasonal (GS-5/1, 10 PP @ \$1520/PP = \$ 15,200 -- FY21	1	\$15,200.00	\$15,200.00
+ -	CR Staff: seasonal GS-7/1, 10 PP @ \$1840/PP = \$18,400 --FY21	1	\$18,400.00	\$18,400.00
+ -	NR staff: seasonal GS-7, 8 PP@ \$1840/PP = \$14,720 -- FY21	1	\$14,720.00	\$14,720.00
+ -	NR staff: seasonal GS-5, 8 PP@ \$1520/PP = \$12,160 -- FY21	1	\$12,160.00	\$12,160.00
+ -	Interp staff: seasonal GS-7/1, \$2231/PP@ 13 PP = \$29,003 -- FY21	1	\$29,003.00	\$29,003.00

	FISCAL YEAR	PLANNED INITIATION DATE	PLANNED COMPLETION DATE	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COSTS
	Difference should be zero (SUMMARY COST TOTAL - SPECIFICATION TOTAL)							(\$12,891.00)
	SPECIFICATION TOTAL							\$220,282.00

Work Agent C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
2.	Documented cost figures from similar project work obtained from local agency sources.	☐ P ☐ E ☐ M ☐ T ☒ C ☐ F
3.	Estimate supported by cost guides from independent sources or other federal agencies	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
4.	Estimates based upon government wage rates and material cost.	☒ P ☒ E ☒ M ☒ T ☒ C ☐ F
5.	No cost estimate required - cost charged to Fire Suppression Account	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT

PART F - INDIVIDUAL SPECIFICATIONS

TREATMENT/ACTIVITY NAME	Storm Patrol and Road Cleanup	PART E SPECIFICATION #	ES-5
NFPORS TREATMENT CATEGORY*	Human Life and Safety	FISCAL YEAR(S) (list each year):	FY21, FY22, FY23
NFPORS TREATMENT TYPE*	Hazard Removal – Other	WUI? Y/N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

General Description: The Caldwell Fire burned across two slopes that may present erosional issues during rainfall events, at Devil's Homestead/Gillem Bluff and Caldwell Butte. Altho soil burn severity is Low-Moderate at these sites, rainfall events may bring debris down to the 10 road below, particularly at Caldwell Butte. A lesser concern exists at Devil's Homestead/Gillem Bluff due to rockfall, but some soil debris could move downslope in a large rainfall event. NPS staff will need to quickly remove debris at both/either site to eliminate a possible road hazard and haul material away to an approved location. Heavy equipment and a dump truck will be needed to haul debris away. Storm patrol work is expected to occur for 8 storms during the first fall/spring (2020/2021), 4 storms during the second fall/spring (2021-2022), and 2 storms during the third fall/spring (2022-2023). Funding for this specification enables park staff to complete debris removal in a timely manner.

Location/ (Suitable) Sites: Devil's Homestead/Gillem Bluff and Caldwell Butte.

Design/Construction Specifications: Immediately following rainfall events park staff need to survey each site along 10 road and determine if debris has fallen to the road; if so, debris needs to be removed to allow safe passage on the road. If necessary a LE ranger will be needed onsite to control traffic. If debris has reached the road at Caldwell Butte, the gate should be closed at the south entrance, and consideration should be given to closing the road near park headquarters. Material will be hauled away to an approved location.

Purpose of Treatment Specifications (relate to damage/change caused by fire): Debris on roads can be a safety hazard for park visitors and staff, and needs to be removed as quickly as possible.

Treatment Reasonableness and Cost Effectiveness: Debris removal is an appropriate response to the possible threat that exists in these locations during rainstorms. Park staff are the closest responders to such an event, and the park has operators and equipment to complete the task.

Treatment Effectiveness Monitoring Proposed: Debris will be removed immediately following events, and if necessary the 10 road will be closed to traffic until the debris is removed.

Treatment consistent with Agency Land Management Plan (identify which plan): Foundation Document, 2017

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).		QUANTITY	UNIT PRICE	AMOUNT
+ -	WG-9 Maintenance Mechanic, 24 hrs @ \$44.53/hr = \$1070 x 8 events -- FY21	8	\$1,070.00	\$8,560.00
+ -	WG-8 Maintenance Worker, 24 hrs @ \$29.00/hr = \$696 x 8 events -- FY21	8	\$696.00	\$5,568.00
+ -	WG-9 Maintenance Mechanic, 24 hrs @ \$45.87/hr = \$1101 x 4 events -- FY22	4	\$1,101.00	\$4,404.00
+ -	WG-8 Maintenance Worker, 24 hrs @ \$29.90/hr = \$720 x 4 events -- FY22	4	\$720.00	\$2,880.00
+ -				
+ -	WG-9 Maintenance Mechanic, 24 hrs @ \$47.24/hr = \$1135 x 2 events -- FY23	2	\$1,135.00	\$2,270.00
+ -	WG-8 Maintenance Worker, 24 hrs @ \$30.80/hr = \$740 x 2 events -- FY23	2	\$740.00	\$1,480.00
TOTAL PERSONNEL SERVICE COSTS				\$25,162.00

EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.		QUANTITY	UNIT PRICE	AMOUNT
+ -				
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COSTS				
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -				
TOTAL MATERIALS AND SUPPLY COSTS				
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -				
TOTAL TRAVEL COSTS				
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -				
TOTAL CONTRACT COSTS				

SPECIFICATION COST SUMMARY

	FISCAL YEAR	PLANNED INITIATION DATE	PLANNED COMPLETION DATE	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COSTS
+ -	21	10/01/2020	05/01/2021	F	each	\$1,766.00	8	\$14,128.00
+ -	22	10/01/2021	05/01/2022	F	each	\$1,821.00	4	\$7,284.00
+ -	23	10/01/2022	05/01/2023	F	each	\$1,875.00	2	\$3,750.00
	SUMMARY COST TOTAL							\$25,162.00
	Difference should be zero (SUMMARY COST TOTAL - SPECIFICATION TOTAL)							\$0.00
	SPECIFICATION TOTAL							\$25,162.00

Work Agent C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
2.	Documented cost figures from similar project work obtained from local agency sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
3.	Estimate supported by cost guides from independent sources or other federal agencies	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
4.	Estimates based upon government wage rates and material cost.	☒ P ☐ E ☐ M ☐ T ☐ C ☐ F

5.	No cost estimate required - cost charged to Fire Suppression Account	☐ P	☐ E	☐ M
		☐ T	☐ C	☐ F

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT

PART F - INDIVIDUAL SPECIFICATIONS

TREATMENT/ACTIVITY NAME	Cultural Site Stabilization	PART E SPECIFICATION #	ES-6
NFPORS TREATMENT CATEGORY*	Cultural and Heritage Resources	FISCAL YEAR(S) (list each year):	FY20
NFPORS TREATMENT TYPE*	Site Stabilization	WUI? Y/N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

General Description: Indirect impacts from the Caldwell Fire have the potential to degrade important attributes of cultural features or archaeological sites within Lava Beds N.M. This Specification includes two components: (1) Clear fire-killed trees and woody debris from archaeological sites; (2) Install sandbag check dams to divert water flow eroding cultural features. If any additional post-fire stabilization treatments are identified as cultural resource assessments continue, this specification will be amended.

Location/ (Suitable) Sites: (1) Large fire killed juniper tree above Symbol Bridge Cave entrance (site CA-SIS-001/003); (2) Fire-killed trees at 7 additional sites (sites CA-SIS-020/021, CA-SIS-022/023/024, CA-SIS-044, CA-SIS-1333H, CA-SIS-1572, CA-SIS-2337, LABE-2012G-009). (3) Erosion control with sand bags at site CA-SIS-044.

Design/Construction Specifications: (1) Large fire killed juniper tree above Symbol Bridge Cave entrance (site CA-SIS-001/003) partially burned and fell onto the entrance trail nearly missing a pictograph panel and needs to be cut into smaller pieces and removed. The remaining portion of the fire-killed juniper tree will fall into the cave and poses an immediate threat to anyone near the cave entrance. This hazard tree needs to be removed. (2) Fire-killed trees that may represent a hazard to archaeological sites were noted at 7 additional sites and need to be evaluated and removed if necessary (sites CA-SIS-020/021, 022/023/024, 044, 1333H, 1572, 2337, LABE-2012G-009). (3) Placement of sandbags to divert water flow during heavy rain events to reduce erosion now occurring on historic trail located at site CA-SIS-044. *Note - all project work will require an archaeological monitor. It is anticipated that the limited costs associated with archeological monitoring can be accomplished by staff funded in the cultural resources assessment specification.

Purpose of Treatment Specifications (relate to damage/change caused by fire): (1) Tree at Symbol Bridge Cave is a safety hazard and threatens archaeological resources. Removal of fire killed trees will prevent trees from being uprooted and disrupting archaeological deposits. (2) This treatment is intended to provide stability to a historic trail feature and prevent erosion during heavy rain events.

Treatment Reasonableness and Cost Effectiveness: Proposed treatments will preserve archaeological values for resources included in archaeological districts, cultural landscapes, and/or are of significance to the Klamath/Modoc Tribe. Proposed treatment is minimum action to stabilize high value resources.

Treatment Effectiveness Monitoring Proposed: Archaeological monitor will document completed work and effectiveness of treatment.

Treatment consistent with Agency Land Management Plan (identify which plan): 2017 updated LABE Fire Mgmt. Plan; 2017 LABE Foundation Document

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).		QUANTITY	UNIT PRICE	AMOUNT
+ -	Forestry Tech GS-05 @ \$18.01 for 40 Hours (FY20)	40	\$18.01	\$720.40
+ -	Maintenance Worker WG-05 @ \$22.06 for 20 Hours	20	\$22.06	\$441.20
+ -	Maintenance Worker WG-07 @ \$24.00 for 20 Hours (FY20)	20	\$24.00	\$480.00
+ -	Forestry Tech GS-07 @ \$22.31 for 40 Hours (FY20)	40	\$22.31	\$892.40
TOTAL PERSONNEL SERVICE COSTS				\$2,534.00
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.		QUANTITY	UNIT PRICE	AMOUNT
+ -	GSA vehicle - Vehicle for one week to travel to stabilization locations	1	\$50.00	\$50.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COSTS				\$50.00
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -	Supplies (sandbags or similar for water diversion, supplies associated with forestry work	1	\$500.03	\$500.03
TOTAL MATERIALS AND SUPPLY COSTS				\$500.03
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -				
TOTAL TRAVEL COSTS				
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):		QUANTITY	UNIT PRICE	AMOUNT
+ -				
TOTAL CONTRACT COSTS				

	FISCAL YEAR	PLANNED INITIATION DATE	PLANNED COMPLETION DATE	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COSTS
+ -	20	8/25	9/31/20	F	9	\$342.67	9	\$3,084.03
	SUMMARY COST TOTAL							\$3,084.03
	Difference should be zero (SUMMARY COST TOTAL - SPECIFICATION TOTAL)							\$0.00
	SUMMARY COST TOTAL							\$3,084.03

	FISCAL YEAR	PLANNED INITIATION DATE	PLANNED COMPLETION DATE	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COSTS
	SPECIFICATION TOTAL							\$3,084.03

Work Agent C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
2.	Documented cost figures from similar project work obtained from local agency sources.	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
3.	Estimate supported by cost guides from independent sources or other federal agencies	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F
4.	Estimates based upon government wage rates and material cost.	☒ P ☐ E ☒ M ☐ T ☐ C ☐ F
5.	No cost estimate required - cost charged to Fire Suppression Account	☐ P ☐ E ☐ M ☐ T ☐ C ☐ F

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT

CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

APPENDICES



Caldwell Fire Burned Area – Lava Beds

APPENDIX A

ENVIRONMENTAL COMPLIANCE

CALDWELL FIRE

Emergency Stabilization and Rehabilitation Plan

ENVIRONMENTAL COMPLIANCE CONSIDERATIONS AND DOCUMENTATION

A. Federal Environmental Compliance Responsibilities

All projects proposed in the Caldwell Fire Post-Fire Response Plan, which includes recommendations for Burned Area Emergency Response (BAER) and Burned Area Rehabilitation (BAR) mitigation actions, that are prescribed, funded, or implemented on park lands are subject to compliance with the *National Environmental Policy Act* (NEPA) in accordance with the guidelines provided by the *Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508)*. This Appendix documents the BAER Team considerations of NEPA compliance requirements for prescribed emergency stabilization, rehabilitation and monitoring actions described in this plan for NPS lands affected by the Caldwell Fire, Lava Beds National Monument, California.

This plan identifies specific emergency stabilization, rehabilitation, and monitoring actions and recommendations designed to mitigate damages to resources as a result of the Caldwell Fire and associated fire suppression activities. The park must complete separate NEPA analyses and compliance for fire response activities not addressed in this plan.

Agency Specific Guidance: This NEPA documentation has been developed in accordance with National Park Service specific guidelines. Emergency stabilization and rehabilitation actions proposed on National Park Service lands, involving the agencies permitting, funding, or implementation, must comply with regulations set forth in the *Department of the Interior Manual Part 516 (DM 12)*.

B. Related Plans and Cumulative Impacts Analysis

Lava Beds National Monument General Management Plan (GMP) and FONSI, 2011 and Foundation Document, 2017. These parkwide plans document the needs and broad direction for fire management within the Monument, including recognizing the challenges ahead related to climate change, interagency fire management across boundaries, and the needs for fire-related research and ecosystem restoration involving fire and management concerns for invasive species.

Lava Beds National Monument Resource Stewardship Strategy, 2012. This plan recognized the need of prior Burned Area Rehabilitation (BAR) monitoring efforts for post-fire native plant seeding efforts, and more generally provides for an integrated approach to preserve long-term ecosystem integrity and

cultural resource preservation. The role of fire on the landscape and close links to cultural resources is a common theme throughout the document.

Lava Beds National Monument Wilderness Stewardship Strategy/Environmental Assessment, 2006.

This plan recognizes the role of natural fire on the Monument landscape, calls for Minimum Impact Management Techniques commensurate with fire behavior and needs for public safety, and directs that all fire management activities within the Wilderness Area will follow established Rehabilitation Guidelines for Wilderness Fire Suppression Activities.

Lava Beds National Monument Fire Management Plan Revision (2005; revision in preparation). This plan covers all elements necessary for a typical unit fire management plan, but also speaks at length about the need for, and expectations, for BAER and BAR planning following a significant fire incident on the Monument.

Cumulative Impact Analysis: The emergency stabilization and rehabilitation treatments for the Caldwell Fire, as proposed in this plan, do not result in an intensity of impact (i.e., major ground disturbance, etc.) that would cumulatively constitute a significant impact on the quality of the environment. The treatments are consistent with the above park management plans and associated environmental compliance documents of the NPS, and categorical exclusions presented below.

No direct or indirect unavoidable adverse impacts to the biological or physical environment would result from the implementation of the Caldwell Fire Post-Fire Response Plan.

Summary of Compliance Documentation Relevant to the Caldwell Post-Fire Response Plan

The following table summarizes the existing NEPA or NHPA compliance in place for the BAER/BAR treatments proposed for the Caldwell Fire. Several treatments may involve ground disturbance, may be near known cultural sites, or involve cultural site stabilization or repair and thus would require archeological/NHPA consultation.

<i>Treatment or Action</i>	<i>NEPA documentation (EIS, EA, or Cat Ex)</i>	<i>Reference to Assessment</i>	<i>Findings of Significance</i>
ES-1: BAER plan preparation	DO-12 CE: 3.3 G.2	N/A	No Significant Impact; NHPA No Potential to Cause Effect
ES-2: BAER Implementation Leader	DO-12 CE 3.3 E	N/A	No Significant Impact; NHPA No Potential to Cause Effect
ES-3: Public Safety and Resource Protection	DO-12 CE: 3.4 C.5	Public Safety/Resource Protection	No Significant Impact: May require NHPA consultation

ES-4: Increased Agency Presence	DO-12: CE 3.3 E; 3.3 Y	Public Safety/Resource Protection	No Significant Impact; NHPA No Potential to Cause Effect
ES-5: Storm Patrol/Road Cleanup	DO-12 CE: 3.4 G.2	Public Safety/Resource Protection	No Significant Impact; NHPA No Potential to Cause Effect; both assume use of existing gravel pit for debris storage
ES-6: Cultural Site Stabilization	DO-12 CE: 3.4 G.2	Cultural	No Significant Impact; May require NHPA consultation
BAR-1: Minor Facilities	DO-12 CE: 3.4 G.2	Minor Facilities	No Significant Impact; Will require NHPA consultation
BAR-2: Increased Trail Maintenance	DO-12 CE: 3.4 G.2	Minor Facilities	No Significant Impact; May require NHPA consultation

C. DOI EXCEPTIONS TO CATEGORICAL EXCLUSIONS

Council on Environmental Quality Regulations at 40 CFR 1508.4 require agencies to consider whether fairly routine actions involve extraordinary circumstances that, per NEPA, trigger an agency to prepare additional assessment and consideration. If it is determined that any of the exceptions listed in the table below apply to a proposed action, that action may not be categorically excluded, and an EA or an EIS must be prepared. The list below is a Department of the Interior list that applies to all DOI agencies (516 DM 2, Appendix 2); agencies often have additional items on their own list of Departmental exceptions, appendix 2). All treatments that are proposed as a Categorical Exclusion for Lava Beds National Monument have been compared against the list of Extraordinary Circumstances listed below and were found not to trigger any exceptions.

Yes	No	Extraordinary Circumstance. Would this action...
	X	2.1 Have significant impacts on public health or safety?
	X	2.2 Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas?
	X	2.3 Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA Section 102(2)(E)]?
	X	2.4 Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?
	X	2.5 Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?
	X	2.6 Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects?

	X	2.7 Have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by either the bureau or office?
	X	2.8 Have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species?
	X	2.9 Violate a Federal law, or a State, local, or tribal law or requirement imposed for the protection of the environment?
	X	2.10 Have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898)?
	X	2.11 Limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007)?
	X	2.12 Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?

D. Consultations

National Park Service

- Jessica Reid, Cultural Resource Manager, Lava Beds National Monument

All BAER and BAR treatments will be presented to the Lava Beds NM Interdisciplinary Team for discussion of the recommended compliance requirements described above prior to initiation of any of the actions.

US Fish and Wildlife Service, National Historic Preservation Act, and tribal consultations:

- The Monument initiated consultation with the CA State Historic Preservation Officer on July 28, 2020 via letter.
- Notification of the fire was made to The Klamath Tribes and the Modoc Nation, by phone on July 24, 2020, and consultation was continued by phone with Perry Chocktoot from The Klamath Tribes when staff returned to the park on August 7th, and again on August 12, 2020.

CONCLUSION

I have reviewed the treatments in the Caldwell Fire Post-Fire Response Plan in accordance with the criteria above. Those actions which require additional environmental review will be analyzed and appropriate NEPA and/or NHPA compliance completed before they can be implemented; those actions with approved existing compliance would not involve any significant environmental effect and are approved for initiation. Lava Beds NM staff will review the proposed projects identified in the Caldwell Fire Post Fire Response Plan and coordinate to ensure compliance with the National Historic

Preservation Act, Endangered Species Act, Clean Water Act and other Federal, State and local environment review requirements.

Prepared by: Jack Oelfke, Caldwell BAER Team Leader, August 17, 2020

Approved: _____

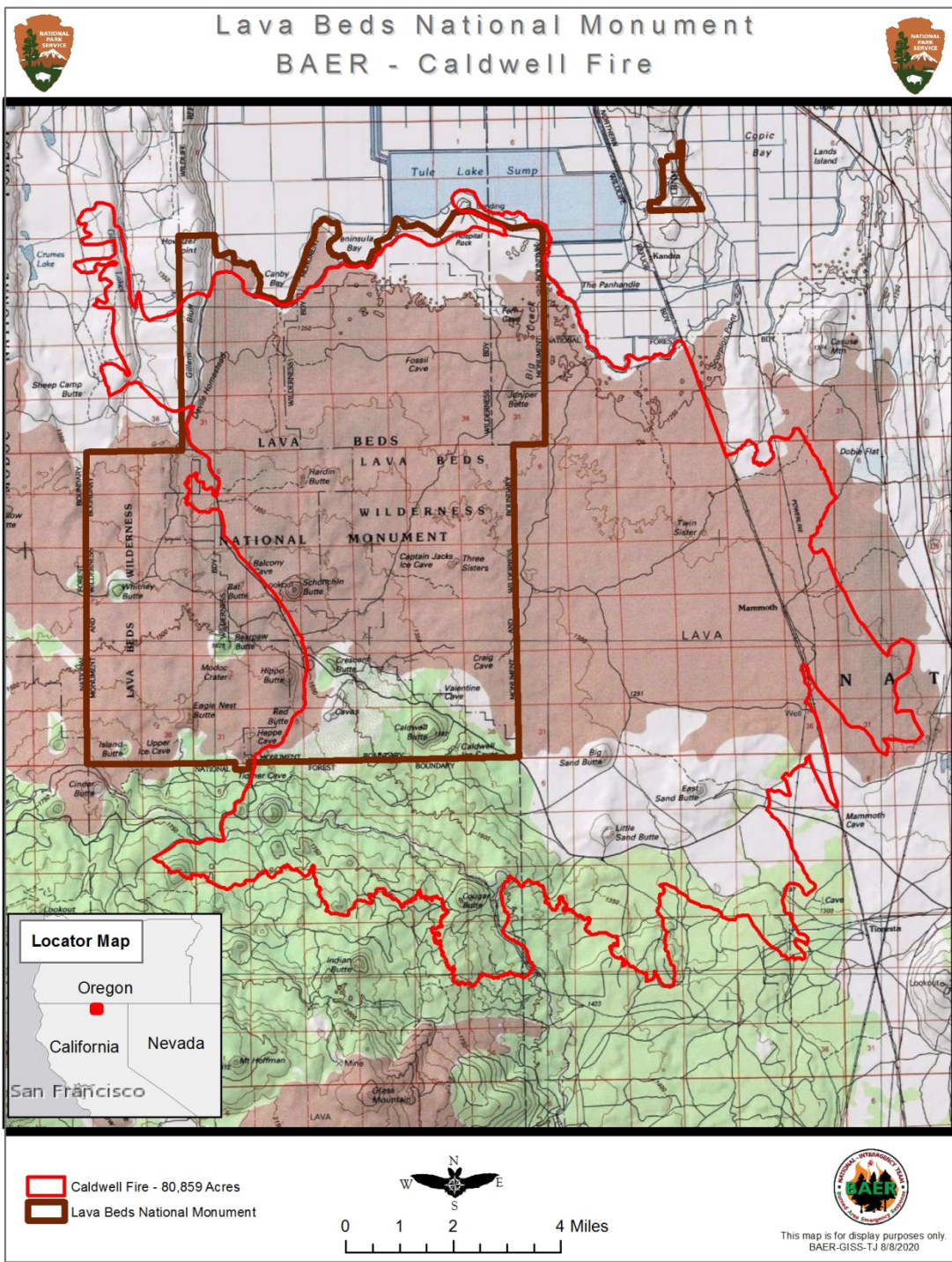
Lawrence J. Whalon, Jr.

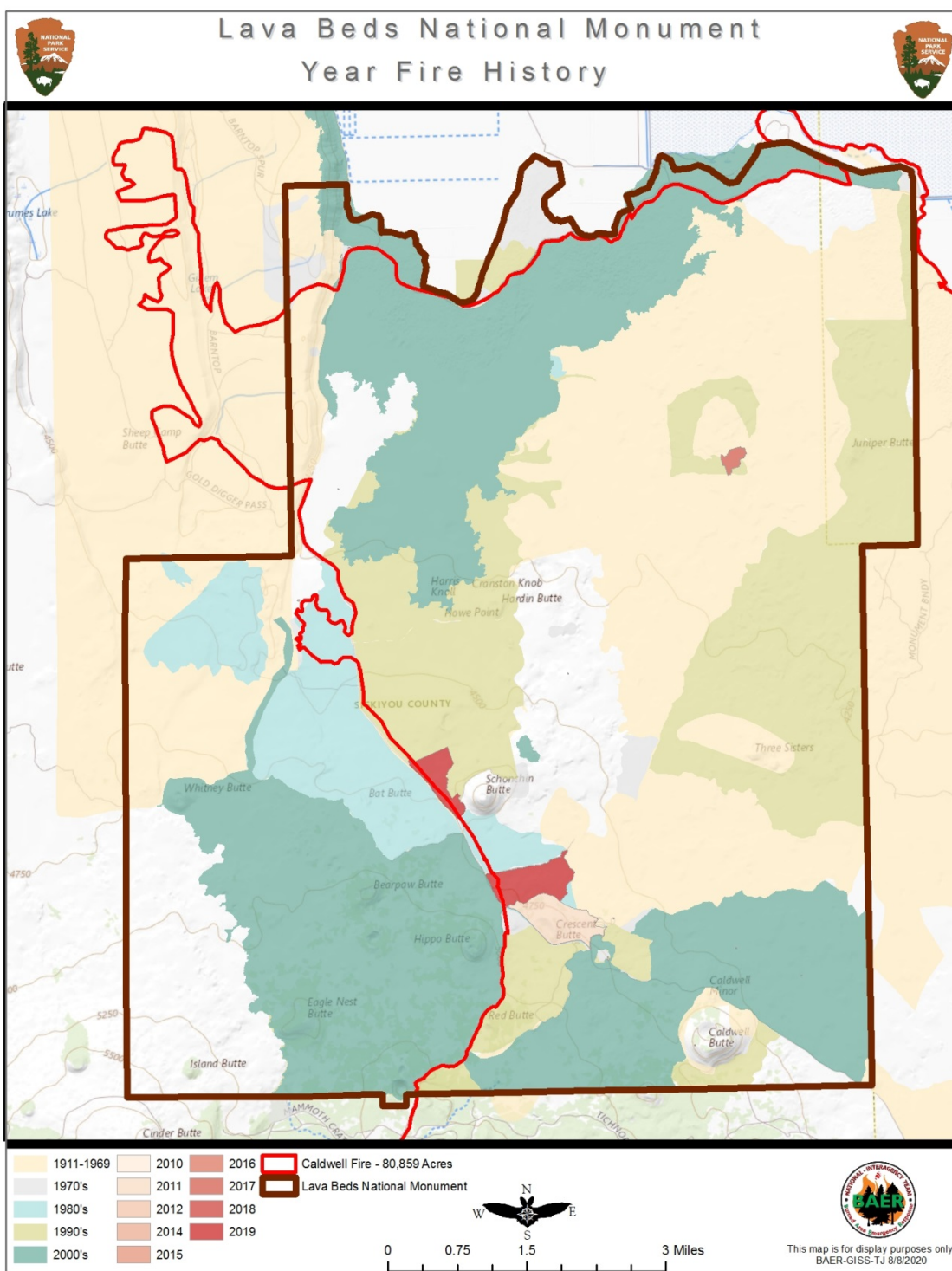
Superintendent, Lava Beds National Monument

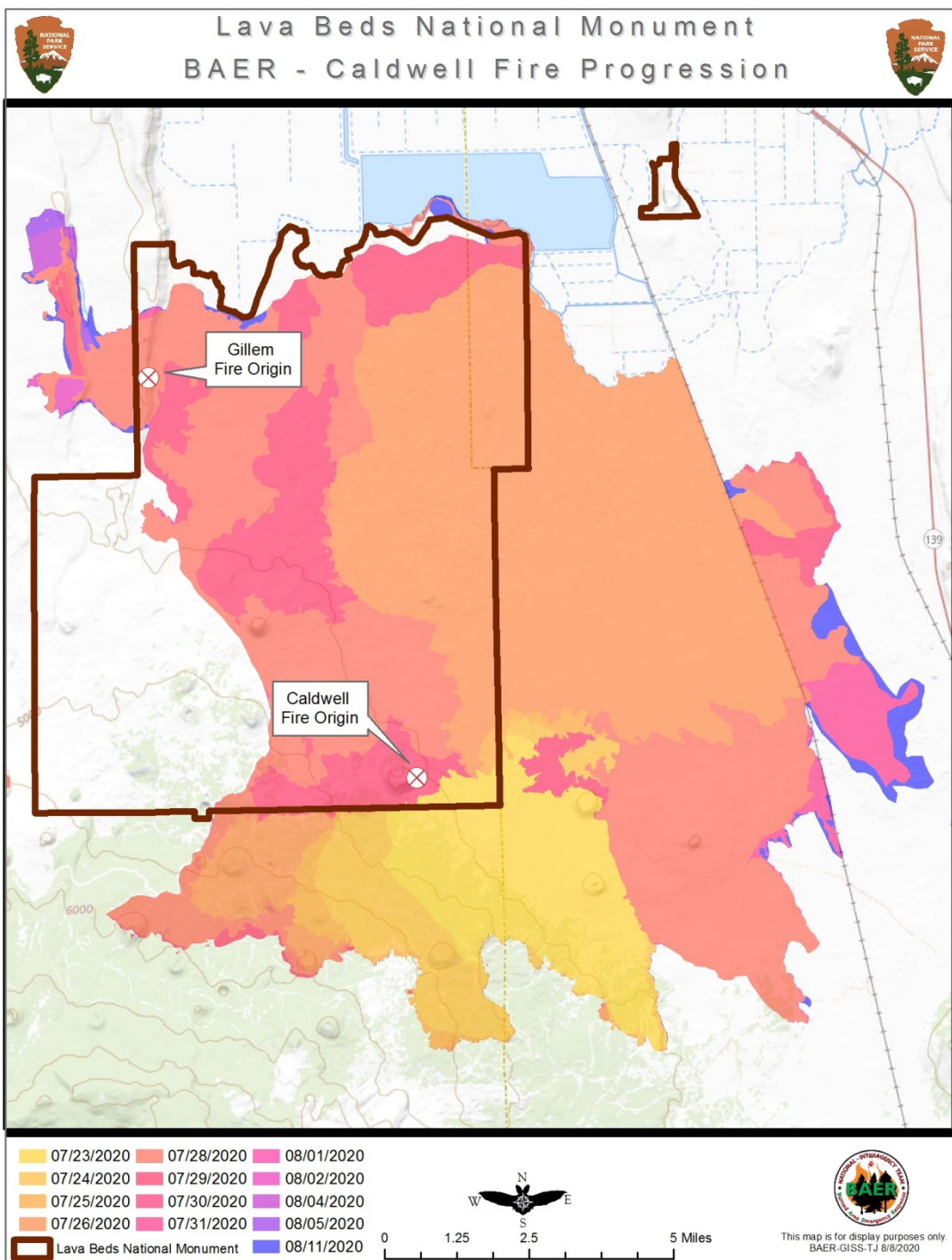
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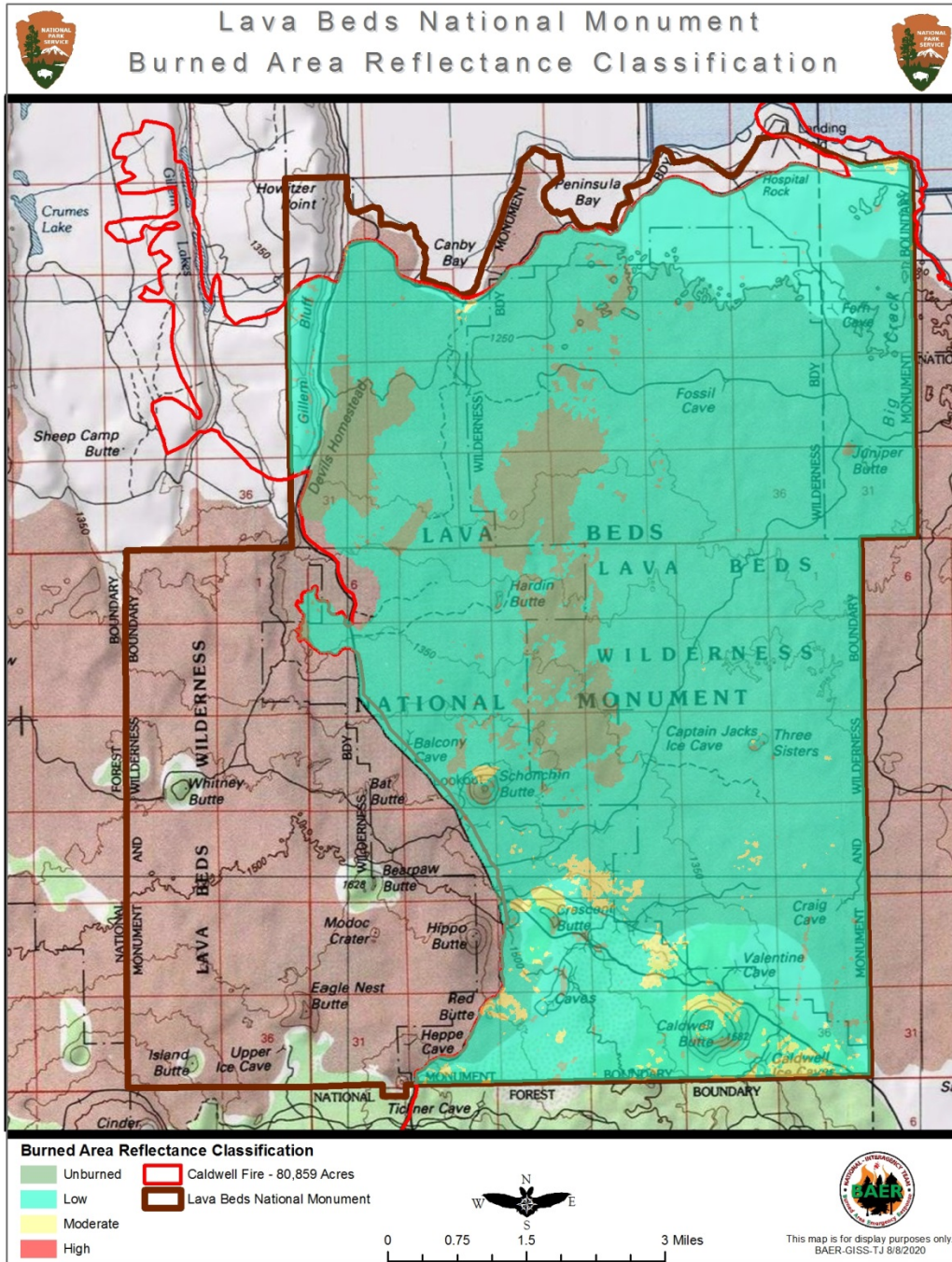
APPENDIX B

Maps









APPENDIX C

Tables

Wood signs				CXT Group Campground signs			
2X12x12	Redwood	19.20 lf					
	Setup Fee	90	labor 4 days (32 hrs) each sign WG 8 29.00			2 California Title 24 / Unisex (Blue Plastic)	295.00
	Shipping	437	18 Signs			4 Sheet Metal Screw #6 x 1" Hex self drilling	0.36
			576 hours @ 29.00	16704.00		4 windows at \$15.70 each	47.10
			Setup Cost	90.00		1 exterior exhaust stack	150.00
			Shipping	437.00		Labor @ WG 7 24.00	72.00
			9 Redwood @230.4 each	2073.60		Total	564.46
			20 posts @ 23.53	470.06	3 hrs		
			Total	19774.66			
Metal Informational signs				Siding on Amphitheater			
			Metal signs	1455.00			
			7 Posts@23.53 Each	164.71			
			Labor WGS 23.00 x 16 hrs	368.00		Hardiplank	12540.00
			5 Carsinite w/decals	132.25		Labor 2 @ \$44.33	7092.80
			Total	2119.96		Total	19632.80
Wildland Fire Danger-2-Sided one side burned paint posts				Electrical panel			
			Chris Orr has the sign just needs installed and posts painted.				\$250.00
			Labor: 96.00	96.00		Labor 1 day WG9 @44.33 an hour	354.64
			45" x 32" two sided sign powder coated .125 aluminum	779.00		Total	5604.64
			Total	875.00			
Total =				\$59,050.14			

Amphitheater Seating Benches				CCC Historical Tables				Non Historical Picnic Tables				Tool Trailer Stairs	
	powder coated metal				One sanded and painted				3@700	2800.00		Not replacing	
	expanded metal benches				One replaced				Shipping	717.00			
					Labor 3 days @24.00	576.00			Assembly 3 hrs @ WG 5 23.00x2	138.00			
	2 24 hrs WG 8 - 29.00		1392.00		300.00 X2 for seats	600.00			Total	3517.00			
	2 22 ft. 6.5 inch	800.00	1600.00		300.00 for top	300.00							
	2 20 ft	730.00	1460.00		Total	1476.00							
	2 17 ft 5.5 in	624.00	1248.00										
	2 15 ft	465.00	930.00										
	2 12 ft 6 in	494.00	988.00										
	2 10 ft	365.00	730.00										
	4 8 ft	259.00	1036.00										
	Total		9384.00										
Bench seats at schonchin				Campground site markers				Gate Closed Ahead					
	4X12 redwood				6 @20.00	120.00			Signs@ 63.88	73.76			
	4 foot long, by 2 foot high.				2 hr @ 23.00 WGS	46.00			Posts@23.53	47.06			
	2 Redwood @ 230.40	460.80			Total	166.00			Labor 3 hrs @ 24.00	72.00			
	8 hrs @ 29.00	232.00							Shipping	50.00			
	Total	692.80							Total	242.82			

Zoom