

# Weston Pass Fire

## July 2018



Date of Report: November 3, 2016

**BURNED-AREA REPORT**  
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST****A. Type of Report**

1. Funding request for estimated emergency stabilization funds  
 2. Accomplishment Report  
 3. No Treatment Recommendation

**B. Type of Action**

1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)  
 2. Interim Report #  
     Updating the initial funding request based on more accurate site data or design analysis  
     Status of accomplishments to date  
 3. Final Report (Following completion of work)

**PART II - BURNED-AREA DESCRIPTION****A. Fire Name:** Weston Pass**B. Fire Number:** CO-PSF-001278**C. State:** CO**D. County:** Park**E. Region:** 02**F. Forest:** PSICC**G. District:** South Park**H. Fire Incident Job Code:** P2LW9W18-0212**I. Date Fire Started:** 6/28/18**J. Date Fire Contained:** Not yet contained (93%)**K. Suppression Cost:** Est. \$9.7 million (as of 7/19/18)**L. Fire Suppression Damages Repaired with Suppression Funds**

1. Fireline waterbarred (miles): 29.1
2. Fireline seeded (miles): 3.7
3. Other (identify): N/A

**M. Watershed Numbers and Percentage Burned:**

12 <sup>th</sup> field sub-watershed	HUC	Total acres	Acres burned	Percent burned
Antero Reservoir	101900010205	35,888	8,099	23%
Headwaters South Fork South Platte River	110200020302	32,586	462	1%
Spring Creek	101900010202	10,356	2,645	26%

**N. Total Acres Burned:**

Land Ownership	Acres Burned	Percent of Burned Area
USDA Forest Service (USFS)	13,418	94.61%
Private	689	4.86%
State	54	0.38%
BLM	22	0.15%
	14,182	100.00%

**O. Vegetation Types**

Forest vegetation within the Weston Pass Fire burned area is a diverse mosaic of forest structures and cover types driven by topographic, moisture, and elevational gradients. Ranging between 9,100 and 11,200 feet in elevation, the burned area is composed of a mix of montane and subalpine forest vegetation, but the predominant ecological systems comprise 95 percent of the area, including: quaking aspen, grassland/forb/shrub, lodgepole pine, ponderosa pine, dry-mesic mixed conifer, and mesic mixed conifer.

**P. Dominant Soils:**

Redfeather-Leadville, Leadville-Tongue River, Parkview-Bushvalley, Quander, Cheadle-Rockcrop, and Nathrop-Cheadle. Soils within the burn area generally have shallow to moderately deep, well-drained, sandy loam and stony loam characteristics with cobble and silt components. The silt, sand, and fine particle structure accommodates organic components concentrated at the surface layer. Ground cover, critical for soil stabilization, is lacking throughout most areas mapped as moderate and high soil burn severity. These soils are sensitive to fire effects, and soil productivity is likely impacted where heavy surface fuels were consumed. High rates of erosion are expected in moderate and high burn soil severity where ground cover was burned.

**Q. Geologic Types:**

The majority of the burn scar is composed of evaporitic facies of Minturn and Belden Formations. The remainder of the burn scar (approximately 146 acres) is composed of Broadway and Louviers alluviums and landslide deposits. The Minturn Formation is composed of siltstone, sandstone, and minor conglomerate, locally imbedded with thin gypsiferous shale near its base. The Belden Formations consists of highly fissile shale, with minor limestone, siltstone, and sandstone. Broadway Alluvium consists of fine to coarse grained well sorted crudely stratified sand and finer grained well stratified silty humic sand. Louviers Alluvium consist of clayey silt and sand and coarse-cobbly clayey sand and gravel. Landslide deposits include slump blocks, mudflows, and talus deposits.

**R. Miles of Stream Channels by Order or Class:**

Stream Class	Length (miles)
Perennial	2.7
Intermittent	44.3
Ephemeral	36.4

## S. Transportation System

Road Maintenance Level	Length (miles)	Trail	Length (miles)
1 - BASIC CUSTODIAL CARE (CLOSED)	6.84	Non-motorized Trail	0.9
2 - HIGH CLEARANCE VEHICLES	10.24		
3 - SUITABLE FOR PASSENGER CARS	5.50		
<b>Grand Total</b>	<b>22.71</b>		

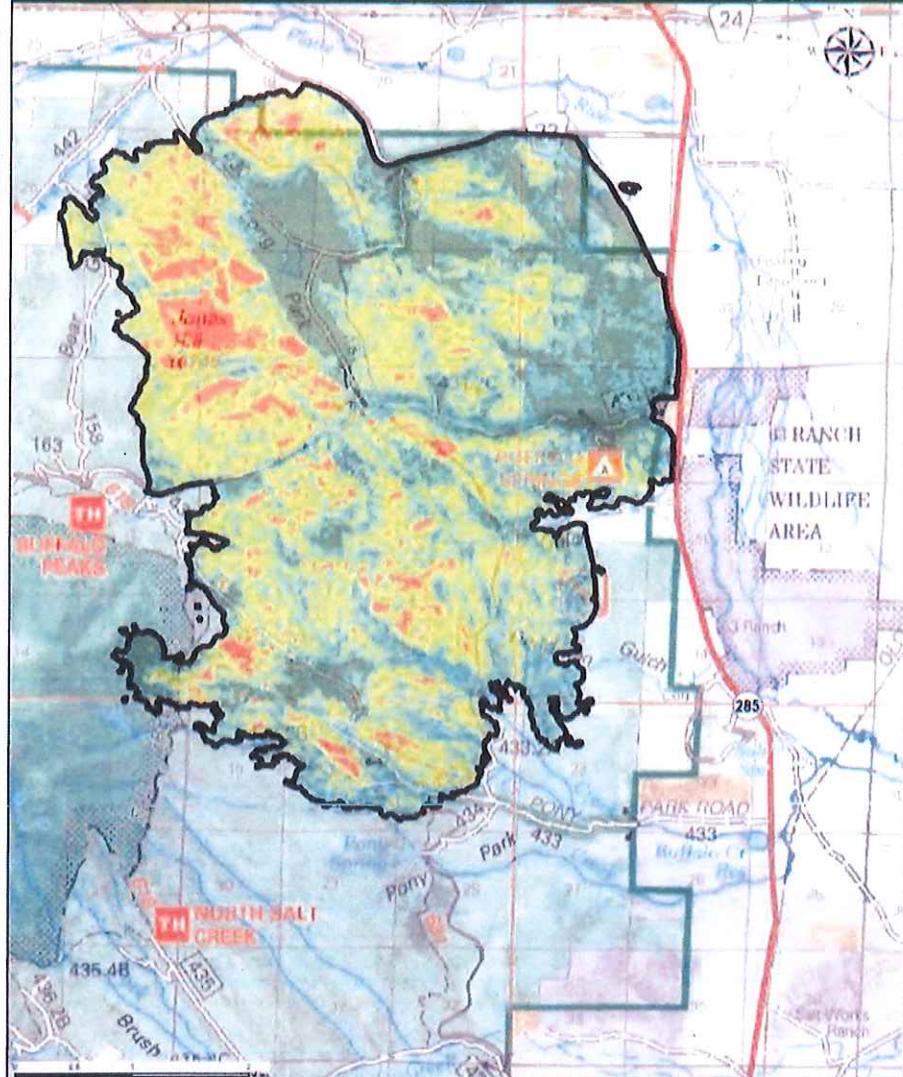
## PART III - WATERSHED CONDITION

### A. Soil Burn Severity for the Whole Burned Area (acres):

Soil Burn Severity for the Weston Fire		
Severity	Acres Burned	Percent
High	689	5%
Moderate	6253	44%
Low	4264	30%
Unburned	2977	21%

# Weston Pass BAER

July 19, 2018



2018 Weston Pass Fire  
Soil Burn Severity  
Burned Area Emergency Response (BAER)

Soil Burn Severity				
BURNED AREA EMERGENCY RESPONSE (BAER)				
	Moderate	Low	Unburned	Total
689	6,253	4,264	2,977	14,182



This is a portion of the BLSB final assessment. The individual identifying the location and quantity of each of the items may be selected from the initial test section. The final format section is similarly assessed or required. Including the following items in the final format section will be considered acceptable if necessary or requested by the test administrator: (a) a copy of the test, (b) a copy of the guidelines for the test, and (c) a copy of the test administration record of the participant.

## Weston Pass Final Soil Burn Severity

## **Soil Burn Severity Summary**

**Burn Severity and Slopes for the Entire Burned Area:** Burn severity and slope heavily influence potential soil erosion due to fire-induced reduction of protective ground cover combined with high runoff potential of steep slopes.

- In chaparral (shrub) vegetation types, the soil burn severity was influenced by the density of pre-fire vegetation. The watershed response in moderate and high burned chaparral areas is expected to be high until the native vegetation recovers.
  - Forested areas with moderate and high burn severity is expected to have similar post fire erosion and

- runoff in the first year following the fire.
- 44% of the fire burned at moderate soil severity. 5% of the burned area has high soil burn severity characteristics. Unburned and low soil burn severity comprises 51% and occurs throughout the burned area. (See Soil Burn Severity Map in the Project File.)

Soils with low burn severity still have good surface structure, contain intact fine roots and organic matter, and should recover in the short-term once re-vegetation begins and the soil surface regains cover. The moderate to high classes have minimal evidence of severe soil heating and this is limited to isolated patches. The most severely burned slopes occur where pre-fire vegetation densities and ground fuels accumulations were higher. Water repellency is present throughout the fire area, including unburned areas like rock outcroppings, and was exacerbated by the fire. While a proportion of eroded soil will remain on the hill-slope, delivery of eroded soil to stream channels is expected to occur. These eroded sediments are a primary source of material for debris flows and sediment laden stream flows.

Soil Burn Severity by Vegetation Type			
Vegetation Type	Soil Burn Severity	Acres	Percent of total burn area
Forest	Unburned/Low	4814	34%
	Moderate	5861	41%
	High	687	5%
Shrub	Unburned/Low	2427	17%
	Moderate	391	3%
	High	2	>1%

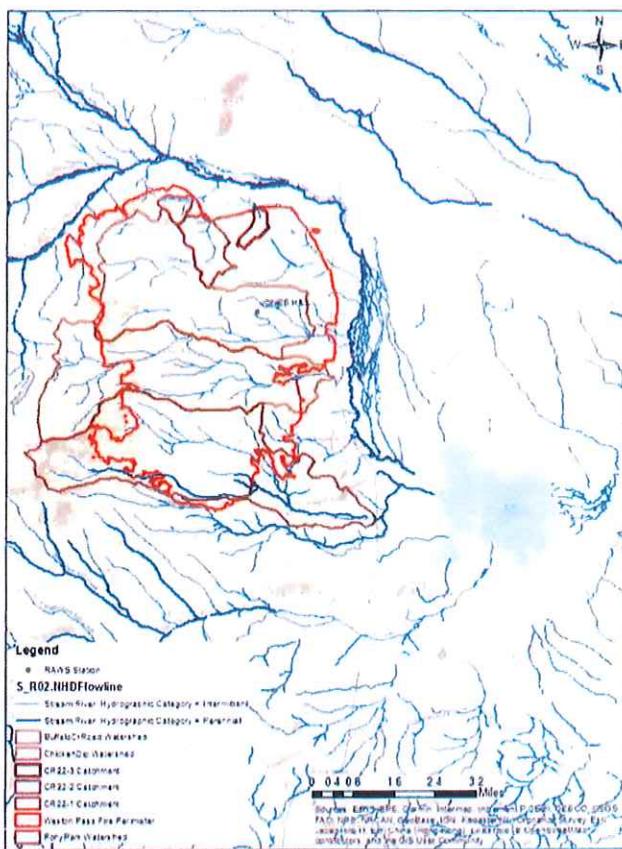
#### Soil Burn Severity by 12<sup>th</sup> Field Watersheds:

12 <sup>th</sup> Field Watershed	Total Acres	Burn Severity Acres (Percent of Watershed)			
		Unburned Acres (%)	Low Acres (%)	Moderate Acres (%)	High Acres (%)
Antero Reservoir	35,888	27,789 (77%)	3,008 (8%)	4,531 (13%)	560 (2%)
Headwaters South Fork South Platte River	32,586	32,124 (98%)	133 (>1%)	315 (1%)	14 (>1%)
Spring Creek	10,356	7,711 (74%)	1,123 (11%)	1,407 (14%)	115 (1%)

#### Soil Burn Severity by Modeled Drainages in Peak Flow Analysis:

Sub-watershed	Total Acres	Acres of Soil Burn Severity			Percent of Sub-watershed			
		High	Moderate	Low and Unburned	High	Moderate	Low	Unburned
Chicken Dip	4659	111	1545	3003	2	33	19	45
Pony Park	5670	115	1403	4152	2	25	18	55
Buffalo Creek Road	4172	386	1820	1966	9	44	22	25
CR22-1	152	18	116	18	12	76	10	2
CR22-2	518	3	165	350	<1	32	32	35
CR22-3	137	2	45	90	1	33	27	39
Antero Main Stem	73839	574	4830	68435	<1	7	4	88

Rough and Tumbling	15672	14	316	15342	<1	2	1	97
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**Weston Pass Modelled Drainages**

#### B. Water Repellent Soils and Increased Runoff:

The degree and extent of water repellent soils is estimated to be 2275 acres or 33% of the moderate and high burn severity areas. However, observations indicated strong repellency at the surface over several vegetation types and moderate to high burn severities. Water repellent soils were also observed in unburned areas. Areas with very fine textured surface layers, high burn severities, and/or thick ash layers commonly had strong water repellency at a depth of  $\frac{1}{2}$  inch. The pattern of water repellent soils is likely to be patchy and mosaic.

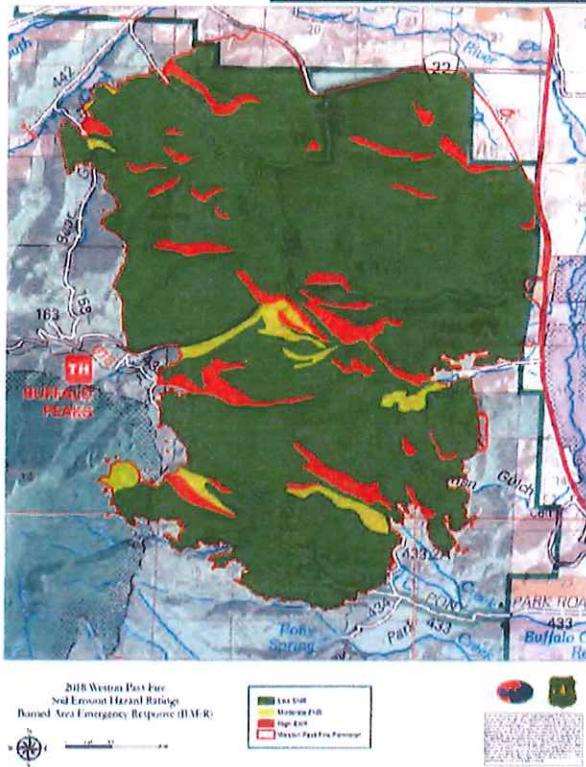
Increased runoff due to hydrophobic conditions is reflected in the peak flow analysis contained in the Hydrology Report. Increased overland flow due to the hydrophobic conditions may increase hill-slope rill and sheet erosion. Hydrophobic layers will usually take six months to two years to break down. Plant root development, soil microbial activity, and freeze-thaw cycling all contribute to the degradation of hydrophobic conditions.

#### C. Soil Erosion Hazard Rating:

The pre-fire erosion hazard rating (EHR) for burned area soils was obtained from existing soil erosion hazard rating information in the San Isabel soil dataset. The EHR interpretation is based on soil properties such as soil texture, slope, aggregate stability, infiltration rate, subsoil permeability, depth to restrictive layers, and soil rock content. The rating is the maximum EHR for the soil map units. Actual pre and post fire erosion potential is better reflected by the ERMIT modeling runs for this project.

Pre-Fire Erosion Hazard Ratings	
Erosion Hazard Rating	Acres
Low	12,180
Moderate	461
High	1,038

Pre-Fire Erosion Hazard Ratings with Post-Fire Soil Burn Severity	
Erosion Hazard Rating And Soil Burn Severity	Acres
Low and Unburned SBS with Low, Moderate, and High EHR	6,885
Moderate and High SBS with Low and Moderate EHR	6,428
Moderate and High SBS with Moderate and High EHR	613



**Weston Pass Fire Erosion Hazard Rating Map**

#### D. Erosion Potential

The following ERMIT results indicate that rates of erosion are very low (**generally close to zero**) in unburned areas. Rate of erosion will increase to over **3 tons/acre** on steep forested hillslopes that were mapped at moderate or high soil burn severity. Extensive removal of forest floor ground cover occurred in these areas. Results also show that recovery of these areas is likely to occur within 3-5 years following the burn. In high and moderate soil burn severity areas, it is highly likely that increased rates of soil erosion and sediment delivery to stream channels will occur, in the first and second year following the fire, particularly on steep slopes. In shrub dominated areas the erosion prediction is relatively low because the slopes did not exceed 20%.

#### E. Sediment Potential: 1707 cy/square mile

## PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period, (years): 3-5
- B. Design Chance of Success, (percent): 75%
- C. Equivalent Design Recurrence Interval, (years): 10
- D. Design Storm Duration, (hours): 1
- E. Design Storm Magnitude, (inches): 1.11 inches (southern side of fire) 1.05 inches (CR 22 northern side of fire)
- F. Design Flow, (cubic feet / second/ square mile): 13
- G. Estimated Reduction in Infiltration, (percent): 49%
- H. Adjusted Design Flow, (cfs per square mile): 95

The fire was divided into drainages with "pour points" established at the bottom of burned watersheds, or where values at risk were located. Watershed runoff response is referenced to these points.

#### Pre and post-fire peak flow predictions from Wildcat Rainfall-Runoff Hydrograph Model

Catchment Name	Area (sq. mi)	10 yr Design Flow (cfs/mi <sup>2</sup> )	10 yr Adjusted Design Flow (cfs/mi <sup>2</sup> )	10 yr Estimated Prefire Discharge from Design Storm (cfs)	10 yr Estimated Postfire Discharge from Design Storm (cfs)	Estimated Postfire Discharge from Design Storm (cfs) with 10% bulking	% Increase
Chicken Dip (Pole Gulch)	7.28	11	58	80	422	465	481
Pony Park (Buffalo Creek)	8.88	18	54	157	483	531	238
Buffalo Springs Road (below Campground)	6.51	9	83	57	538	591	938
CR22-1	0.24	15	196	4	47	52	1195
CR22-2	0.81	15	92	12	75	82	567
CR22-3	0.21	13	87	3	18	20	626

#### Debris Flow Potential

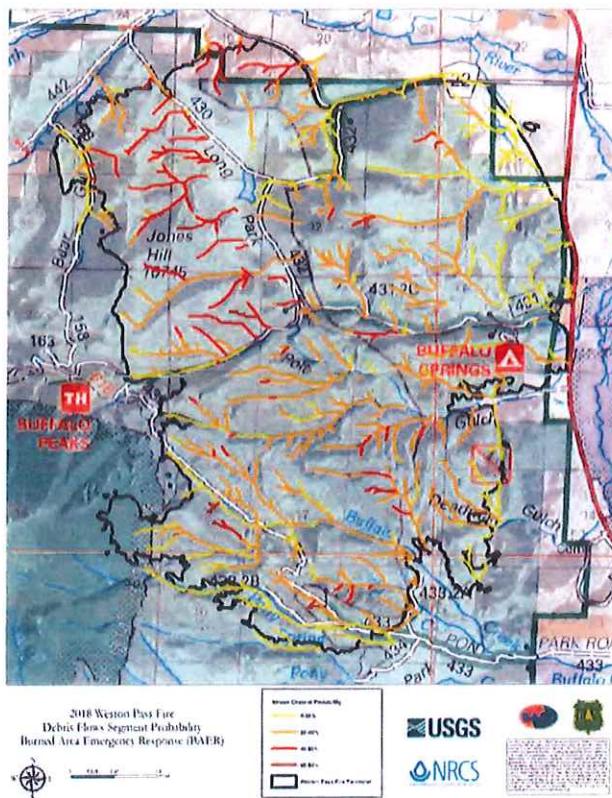
**Geologic Response:** Debris flows are probable in the Weston Pass Fire Area. Shallow organic soil depths relative to bedrock depth and highly fissile shale on steep slopes increase debris flow probabilities. However, moderate slopes with lower soil burn severities will likely have nominal post-fire geologic responses.

**Debris Flow:** The United States Geological Survey (USGS)-Geologic Hazards Division provided predictive debris flow model results with quantitative and qualitative results. Analysis show predictions for channel and basin probability, volume, and hazard for a design storm with a 15 minute intensity of 24 millimeters per hour.

Debris flow and post fire hydrologic modeling are used together to predict the landscape response to high intensity rainfall events. More information on the USGS model and processes used can be found at the following website. [http://landslides.usgs.gov/hazards/postfire\\_debrisflow/](http://landslides.usgs.gov/hazards/postfire_debrisflow/)

Throughout the burned area, the combined hazard ratings for debris-flow in first order tributaries to the main stem stream channels are low to moderate. At the fire perimeter exiting the burned area, the hazard ratings are moderate and low for all stream channels. At the burned area perimeter, volumes are predicted to be >10,000 cubic meters for all stream channels except Buffalo Creek. Buffalo Creek volumes are predicted to be in the range of 10,000 to 100,000 cubic meters.

Pre-fire slope stability and recovery of watershed hydrologic response is dependent on many factors and typically occurs within 3-5 years following the fire. Recovery of high burn severity areas is slower because little or no vegetative ground cover remains, the potential for needle cast is low and soils may be impacted by fire effects. Potential debris flows produced by the burn scar is low to moderate. Debris flows will likely deposit in locations of lower gradient but, during higher intensity and subsequent storm events, can migrate farther downstream.



**USGS Debris Flow Potential - Probability by Stream Segment**

## PART V - SUMMARY OF ANALYSIS

### **Introduction/Background:**

The Weston Pass Fire began June 28<sup>th</sup>, 2018 burning approximately 14,182 acres with 13,418 acres on the South Park Ranger District of the Pike National Forest, 689 acres on private property, 54 acres on State of Colorado land, and 22 acres on BLM. As of July 21<sup>st</sup>, 2018 the fire was 93% contained. The fire burned within several sub-watersheds of the South Platte basin within the Mosquito Range near the town of Fairplay, Colorado in Park County. The area is characterized by low to moderately steep terrain including dissected basins with one enclosed park.

The soil burn severity (SBS) map shows approximately 51% burned at high and moderate soil burn severity. The rest of the fire was either low soil burn severity or unburned. The burn consists of mostly mosaic burn with isolated regions of moderate and high burn severity. Increased post fire soil erosion, runoff and debris flows within and downstream from these areas is likely to cause flooding, scouring and/or deposition of materials. The burn scar received approximately .4 inches of rain on 7/15/18 and .6 inches of rain on 7/16/18 which caused flooding, erosion, debris flows, culvert washouts on Forest roads, and the closure of both Highway 285 and County Road 22.

High intensity summer thundershowers are the precipitation events of primary concern. Based on historic precipitation patterns, thunderstorms are likely to occur in the mid-summer months. The risk of flooding and erosional events has increased as a result of the fire, creating hazardous conditions within and downstream of the burned area.

The duration, volume, and location of debris flows and stream channel processes are highly influenced by rainstorm patterns and intensities. The predictive values represented in this report are based on rapid assessment models for specific high intensity/short duration storms. Recovery of pre-fire slope stability and watershed hydrologic response is dependent on many factors and typically occurs within 3-5 years following the fire. Recovery of high burn severity areas is slower because little or no vegetative ground cover remains, the potential for needle cast is low and soils may be impacted by fire effects.

#### **A. Describe Critical Values/Resources and Threats:**

Potential impacts on human life and safety, property, natural resources and cultural resources were identified by the BAER team. Forest Service values at risk include human life and safety, roads, trails, access to a RAWS station, Buffalo Springs Campground, critical habitat for T&E species (Mexican Spotted Owl, Canada Lynx, and Wolverine), hydrologic function, recovery of native vegetation due to increased risk for establishment and/or spread of noxious weeds as well as grazing, historic properties (lithic scatters and culturally modified trees), agricultural pipelines, spring developments, and historic land survey monuments. Non-Forest Service values include human life and safety, municipal water supply, a private reservoir, County Road 22, Highway 285, irrigation ditches, and a stream gauge.

The BAER team began assessing the area for post-fire emergencies on July 16<sup>th</sup>. In that time the team has identified the following values at risk and post-fire threats. Interim reports may be submitted as additional assessments are completed and/or the need to repair or maintain BAER treatments emerges.

*The BAER risk matrix (Exhibit 2 of Interim Directive No. 2520-2010-1) was used to evaluate the Risk Level for each value identified during Assessment.*

##### **1.) Human Life and Safety**

Potential threats to visitors/recreating public, residents of private lands, & Forest Service employees include flooding with the potential for localized debris flows, hazard trees and rock fall, and loss of ingress and egress. These threats exist along roads, at recreation areas, and to permitted uses downstream or downslope of burned slopes, particularly in areas with a high or moderate soil burn severity. Risk is increased with higher probability in places having greater access and more frequent concentrations of people. Locations with increased risk include: Forest roads and trails within the burn perimeter and Buffalo Springs Campground. Although Buffalo Springs Campground did not burn it is still at very high risk due to flooding and debris flows from up-slope burned areas.

- *Forest visitors, employees, and permittees*

**High or Very high risk** (likely, moderate; very likely, moderate; likely, major) to **forest visitors, Forest Service employees, and range permittees** within and adjacent to the burned area travelling 431, 433, 158, 168, 433.2A, 430, 431.2C, trail 618, at Buffalo Springs Campground, and at dispersed rec sites

due to the **increased threat of falling trees, rolling rocks, flash floods, and debris flows** within the burned area. (Treatments PS-01 Temporary Closure, PS-02 Warning Signs)

**Intermediate risk** (possible, moderate) to recreating forest visitors and Forest Service employees travelling 432, trail 631, and all of the Level 1 roads within the burn due to the **increased threat of flash floods, debris flows, falling rocks, and trees**. (Treatments PS-01 Temporary Closure, PS-02 Warning Signs)

**Low risk** (unlikely, moderate) to recreating forest visitors and Forest Service employees travelling 433.2B.

➤ *Citizens on Non Forest Service Roads & Properties*

There are risks associated with flooding and debris flows caused by post-fire conditions to citizens travelling on County Road 22 and Highway 285 as well as private residences on the south side of County Road 22 and at the Old 63 Ranch west of 285. Field investigations at each of these sites were conducted by the BAER team but risk assessments were not completed as these are not Forest Service properties or values. The BAER team will communicate the findings of their field investigations to partners (NRCS, Park County Emergency Manager, CDOT, Park County Road & Bridge, National Weather Service, etc.) as soon as possible.

## **2.) Property**

Note: Property with **low risk** are not included in this report but can be found in the VAR table.

➤ *Forest Service Road and Trail Infrastructure*

There are 22.7 miles of National Forest System Roads (NFSR) and 0.9 miles of National Forest System Trail within the burn perimeter. Post-burn conditions and the predicted watershed response indicate the potential for increased runoff and overland water flow, with movement of sediment and debris downslope into road and trail drainage features such as ditches, culvert inlets, roadway dips, run outs, and trail drain dips. Once these drainage features become impacted and overwhelmed by the increased runoff, their function fails causing uncontrolled water to divert, with a resulting in major damage to the invested improvements, loss of travel-way/trail tread function, and loss of access along some road segments.

**High or Very high risk** (likely, moderate or very likely, moderate) to portions of **National Forest System Road 431, 431.2B, 433, 158, 168, 433.2A, 430 and National Forest System Trail 618** due to **increased overland flow and accelerated hillslope erosion** concentrating on road/trail segments downslope from areas burned at moderate and high severity as well as increased flow and debris overwhelming roads at stream crossings. Evidence of this type of damage beginning on roadways was observed after the rainfall occurring 7/15-7/16 in the form of erosion and washed out culverts. Damage to or failure of road segments constitute a loss of Forest Service infrastructure, with the accumulated threat of accelerated sediment delivery to adjacent streams leading to municipal water sources. (Treatment: RT-01 Storm-proofing and treatment monitoring)

➤ *Developed Rec Site – Buffalo Springs Campground*

Although Buffalo Springs Campground did not burn, threats to infrastructure within the campground including a vault toilet and potable water hand pump exist due to the location of said infrastructure in the bottom of a drainage which experienced a significant amount of moderate burn.

**High risk** (likely, moderate) to **infrastructure within Buffalo Springs Campground** due to **increased overland flow and accelerated hillslope erosion** concentrating and damaging the foundation of one vault toilet and one potable water hand-pump which are vital infrastructure and represent an investment into the recreation area. (Treatment: RT-01 Storm-proofing and treatment monitoring)

➤ *Spring Developments*

Three spring developments exist within the burn perimeter all of which are used for grazing water development associated with the McQuaid allotment. This allotment is the second largest grazing permit on the Pike National Forest covering 44,180 acres with 28% of that acreage having burned in this fire.

**High risk** (likely, moderate) to **spring developments** due to **flooding and sedimentation** damaging spring infrastructure, decreasing hydrologic function, and negatively effecting water quality. (Treatment: LT-01 Ag-water Development Stabilization).

➤ *Agricultural Supply Water Delivery Pipeline*

Out of an original 10 miles of heavy-duty black plastic pipe (feeding 11 stock tanks), approximately 5 miles remains unburned. This is the main supply line feeding stock tanks within the McQuaid allotment and it runs immediately adjacent to Forest Road 431.

**Very High risk** (likely, major) to **water delivery pipeline for stock water** due to **flooding and erosion** damaging the remaining pipe-line which is critical to the allotment within the burn (second largest livestock permit on the Pike National Forest). (Treatment: LT-01 Ag-water Development Stabilization)

➤ *Jones Hill RAWS Station Access*

The Jones Hill RAWS weather station is located 0.4 miles north of FR 431. This weather station is part of the Remote Automatic Weather Stations system which monitor the weather and provide weather data that assists land management agencies with a variety of projects such as monitoring air quality, rating fire danger, and providing information for research applications. Continuing access to this weather station is necessary to perform maintenance and repairs.

**High risk** (likely, moderate) to the **RAWS access road** due to **flooding and erosion** causing damage to the road prism making it impassible. This would cut off access to the weather station, which is a significant Forest Service improvement. (Treatment: RT-01 Storm-proofing)

➤ *Historic Land Survey Monuments*

Existing survey monuments that control the public land boundaries are at risk of being lost or damaged due to the Weston Pass Fire and the residual effects from the fire. Loss of the monuments would require considerable funding to reestablish the boundaries based on controlling land survey monuments in areas that have not been effected by the residual effects from the fire.

**Very High risk** (very likely, moderate) to **Historic Land Survey Monuments** due to **flooding, debris flows and falling hazard trees** destroying or covering existing historic stone survey monuments. (Treatment: LT-04 Historic Survey Monument Protection)

➤ *Non-Forest Service Roads*

There are risks associated with flooding and debris flows caused by post-fire conditions to drainage structures on County Road 22 and Highway 285. Field investigations were conducted by the BAER team but risk assessments were not completed as these are not Forest Service values. The BAER team will communicate findings to cooperators (CDOT and Park County Road & Bridge) as soon as possible.

➤ *Non-Forest Service Irrigation Ditches, Ponds, and Stream Gauge*

There are risks associated with flooding and sedimentation caused by post-fire conditions to private

ditches, ponds, and a Colorado DNR stream gauge located downstream from the burned area. Field investigations were conducted by the BAER team but risk assessments were not completed as these are not Forest Service values. The BAER team will communicate findings to cooperators (Colorado DNR and NRCS) as soon as possible.

### **3.) Natural Resources**

Note: Water quality and hydrologic function within Rough and Tumbling Creek has **Intermediate risk**, details can be found in the VAR table. No treatments are proposed.

#### **➤ North American Wolverine Habitat, Mexican Spotted Owl Habitat**

The North American Wolverine is highly mobile and there is much remaining suitable habitat throughout the planning area. The burn area does not contain habitat classified as Protected Habitat, Forest Recovery habitat (nest/roost), or Rocky-canyon habitat for the Mexican Spotted Owl. However, the burned area contains 38 acres of Riparian Recovery habitat that has the potential to provide the habitat structure used by this species for nesting, roosting, foraging, and dispersal.

**Very Low risk (unlikely, minor) to suitable occupied North American Wolverine and Mexican Spotted Owl habitat** within the burn perimeter as a result of **erosion, sedimentation, and wind-fall of exposed stands**.

#### **➤ Canada Lynx Habitat**

Within the fire perimeter approximately 4,061 acres of lynx habitat burned which accounted for 14% of the available habitat within the LAU being altered by fire.

**Intermediate risk (possible, moderate) to suitable occupied Canada Lynx habitat** within the burn perimeter as a result of **erosion, sedimentation, wind-fall of exposed stands, and loss of understory**.

#### **➤ Native or Naturalized Plant Recovery (Range Mgmt)**

The area within the perimeter of the Weston Pass fire has been the focus of several large-scale Forest Service projects with significant support from outside partners. Rocky Mountain Elk Foundation, CPW-Habitat Partnership Program and the Forest Service have teamed up to complete 2 riparian restoration projects now within the fire perimeter involving gully contouring, tree felling and jack-strawing, spring development, and seeding. One of the projects has been monitored each year since as has been highlighted in training sessions, workshops and national presentations. In addition, major investments were made throughout the area using FS dollars and matching funds from CSU, the county and others to install, monitor and maintain gully repair and stabilization features (rock dams, grade stabilizers, channel armoring and seeding). Where this work was done, systems held up to fire effects, but will require vegetation protection for full recovery. The relationship between the Forest Service and the FS grazing permittee on the McQuaid Allotment (second largest allotment on the Pike National Forest) has been key in the success of managing and improving the natural resources (vegetation, soil, and hydrology) in this area. In the immediate future, the grazing permittee will be dealing with significant loss on many scales. Burned acres are found across 28% of the allotment and every pasture has at least some portion burned by the fire. The permittee will ultimately bear the burden of rebuilding interior pasture fences however in the spirit of cooperation to maintain the existing high value relationship, the Forest Service would like to support his past efforts and future endeavors by allowing him and his family to graze their cattle on the most critical low or unburned portions of this important allotment.

**High Risk (likely, moderate) to native and naturalized plant communities** as well as riparian

treatments due to **access to burned areas by permitted cattle** caused by burned fence-line. The recovery of native plant communities within the burned area will be critical to the continued success of the riparian treatments. These treatments represent a significant investment by the Forest Service as well as matching investment from partners. In addition maintaining a strong working relationship with the grazing permittee by allowing him to utilize critical un-burned portions of his allotment will be instrumental moving forward for successful restoration within the area. (No Treatment - Seek funding outside BAER to replace burned fence-line)

Additionally, many miles of privately owned boundary fence burned during the Weston Pas fire. This burned fence will result in private cattle trespassing onto NFS lands and threatening the recovery of native plant communities.

**High Risk** (likely, moderate) to **native and naturalized plant communities** due to unauthorized livestock use by private cattle on NFS lands. (No Treatment – Coordinate with NRCS)

➤ *Native or Naturalized Plant Recovery (Noxious Weeds)*

Although there are currently only small populations of Canada Thistle within the burn perimeter, there are large zones of high value weed-free areas which will be threatened by the spread of noxious weeds.

**High Risk** (likely, moderate) to **native and naturalized plant communities** including riparian zones and rangelands with naturally low vegetation cover, and areas that had disturbances caused by suppression activities such as dozer lines and drop points are at risk due to **spread of noxious weeds and invasive plant species**. Invasive weed species that exist within and adjacent to the fire area that may impact native plant communities include: Canada thistle (Treatment LT-02 Early Detection and Rapid Response)

➤ *Soil Productivity*

**Low Risk** (possible, minor) to **soil productivity** associated with post-fire threats from **accelerated hillslope and sheet erosion, rilling, and gullying in moderate and high burn severity areas**. Increases in soil erosion are expected from post-fire environments primarily from the loss of protective soil cover and nutrient-rich organic matter, thereby decreasing soil productivity. Analysis of existing soil conditions and landtypes within the burned area suggests an increased probability for elevated erosion over the inherent high erosion hazard combined with high and moderate burn severity. Although post fire soil erosion is expected to occur, an emergency for long-term soil productivity was not caused by the direct effects of fire. Despite post-fire soil erosion (sediment transport, increased overland flow and wind), soils in the burned area will support recovery of fire adapted vegetation. Risks to soil productivity will diminish as forest floor recovery occurs, therefore natural soil recovery is considered an appropriate response action. While there are no treatments recommended to protect the soil productivity, other land and road treatments will provide some protection to soil productivity in the burn area.

➤ *General Hydrologic Function*

**High risk** (likely, moderate) from **increased run-off with overland flow influencing erosion and sediment delivery to hydrologic function from post-fire conditions**. There are potential threats to hydrologic function in areas of moderate and high burn severity as well as cascading effects from these areas to hydrologic function in the lower portions of watersheds experiencing low/unburned conditions. The presence of hydrophobic soils, loss of canopy cover, loss of ground cover, and loss of channel stabilizing riparian vegetation in multiple areas in addition to existing soil condition and channel incision all have the potential to contribute to altered hydrologic function and watershed response to precipitation events within the burned watersheds. Road and channel treatments (RT-01 Storm-proofing, CT-01 Channel Stabilization) will help alleviate the emergency by limiting the downstream effects of flooding, erosion, and sediment transport into streams and intermittent drainages.

➤ *Hydrologic Function Immediately Below Chicken Dip Earthen Dam*

Chicken Dip (informally named by the Weston Pass fire suppression team) is an un-named water body located directly upstream from the Old 63 Ranch with an earthen dam fed by a 4659 acre drainage area composed of 35% high and moderate burn severity. Hydrologic modelling at the Chicken Dip pour point predicted a 481% increase in post-fire flow. Two smaller earthen dams exist directly upstream from the larger Chicken Dip dam. Field observations revealed that all three structures were overwhelmed during the 7/15-7/16 rainstorms with a cascading effect causing erosion of the dams and outlet channels and ultimately threatening the hydrologic function immediately downstream.

**Very High risk** (very likely, major) to **hydrologic function downstream from Chicken Dip earthen dam** due to **increased inflow/flooding and debris flows resulting in dam breach with cascading failure effects** within down-stream channels which are prone to extreme head-cutting. Dam failure would also negatively affect water quality of streamflow leading into Antero Reservoir (Denver Water municipal water source - Non-FS value) as well as pose a threat to the human life and safety of the private residents who reside directly below the dam at the Old 63 Ranch. (Treatments: CT-01 Channel Stabilization)

➤ *Non-Forest Service Municipal Water Supply & Storage*

There is a potential threat to domestic water supply off NFS lands due to the close proximity of Antero Reservoir and also Spinney reservoir which lies downstream of Antero. This potential threat is from increased sediment and turbidity, as well as increased peak flood flows which can damage or clog surface water supply intake systems. There is also a potential threat for sediment and debris delivery to Buffalo Springs Reservoir, which lies immediately downstream of the burned area in the Pony Park watershed and is already experiencing debris and ash-laden flows from the 7/15-7/16 storms. Field investigations were conducted by the BAER team but risk assessments were not completed as these are not Forest Service values. The BAER team will communicate findings to cooperators (Denver Water, Aurora Water, Ranch of the Rockies HOA, CUSP) as soon as possible and will continue to collaborate with partners who may be interested in providing outside funding to implement treatments on NFS lands to reduce risk to their private values. Potential treatments cooperators may consider include but are not limited to mulching, log erosion barriers, and head-cut stabilization. (CT-02 Interagency Coordination)

#### **4.) Cultural and Heritage Resources**

Note: Cultural resources with **intermediate or low risk** are not included in this report but can be found in the VAR table.

➤ *Cultural Resources*

One hundred and ninety one (191) cultural properties were identified within the fire perimeter. Forty five (45) of the sites are considered officially "eligible" or "needs data" for inclusion to the NRHP. It is only these sites that are eligible for listing to the NRHP that were assessed for risk as critical BAER values. Site types include lithic scatters, open camps, and an historic erosion control feature.

**High and Very High Risk** (possible, likely, very likely, major) to **twenty-nine (29) critical eligible Cultural and Heritage Resources** within the burn perimeter as a result of **increased potential for looting** resulting from increased public searching for sites and exposure of previously concealed artifacts and features.(LT-03 Cultural Resource Protection - Conceal with Slash)

#### **B. Emergency Treatment Objectives:**

1. **Roads**
  - Minimize or prevent post fire impacts on selected NFS roads (or sections of road)
  - Minimize or prevent impacts on soil and water resources resulting from increased post fire erosion and storm water runoff from roads
  - Minimize risk for potential impacts to the life and safety of road users
  
2. **Trails**
  - Storm proof trails (these treatments are primarily designed to prevent the uncontrolled channeling and resultant damage to trails and to reduce erosion and further watershed degradation by control of run-off within the trail prism)
  - Close selected trails to minimize risk for potential impacts to the life and safety forest visitors
  
3. **Developed Rec Site (Buffalo Springs Campground)** – Prevent damage to outhouse (both vault and stick-built structure) and hand pump.
  
4. **Ag-Water Development** - Prevent damage to spring developments as well as main water distribution line.
  
5. **Ecological integrity** Decrease noxious weed infestation/spread, provide early detection/rapid response of new infestations or species, protect currently weed-free areas and existing native plant communities, and allow for recovery.
  
6. **Channel Stabilization**
  - Minimize risk for potential impacts to the life and safety of private homes directly downstream
  - Minimize or prevent impacts on hydrologic function and municipal water quality resulting from increased post fire flows creating a cascading failure of all three earthen dams at this location
  
7. **Cultural/Heritage** – Reduce the risk of loss of site integrity, artifacts, and/or cultural features.
  
8. **Interagency Coordination** – Engage with collaborators and partners who are interested in providing funding for treatments within the Weston Pass burn area outside of the proposed BAER treatments. Specifically coordination with CUSP (Coalition for the Upper South Platte) and Denver Water.
  
9. **Protection and Safety:** Implement closure and warning sign treatments to protect the life and safety of forest visitors and workers.

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

Land 75 % Channel 75 % Roads/Trails 75 % Protection/Safety 95 %

#### **D. Probability of Treatment Success**

	Years after Treatment		
	1	3	5
Land (weed & range)	75	95	100
Channel (stabilization)	75	95	100
Roads/Trails	75	95	100
Protection/Safety	95	100	100

**E. Cost of No-Action (Including Loss): \$205,050**

**F. Cost of Selected Alternative (Including Loss): \$117,534**

The VARTool was used to calculate an overall benefit/ cost ratio of 1.2 for implementing road, trail and land survey monument protection treatments which indicates that treatments are justified.

**G. Skills Represented on Burned Area Survey Team:**

Name	Specialty	Home Unit
Cait Woods	<i>Team Lead</i>	PSICC
Jamos Schmidt	<i>Roads Engineer</i>	PSICC
Katie Buchan	<i>Hydrologist</i>	MBR
Leah Shipstead	<i>Soils</i>	PSICC
Felix Quesada	<i>Biologist</i>	PSICC
Kristen Meyer	<i>Biologist (t)</i>	PSICC
Jeff Hyatt	<i>Recreation</i>	PSICC
Janelle Valladares	<i>GIS</i>	PSICC
Sheila Lamb	<i>Range/Weeds</i>	PSICC
Laura Aker	<i>Archeology</i>	PSICC
Rochelle Rhoan	<i>Archeology (t)</i>	PSICC
Sean Hines	<i>Land Survey</i>	BLM, Salida
Cathleen Thompson	<i>PIO</i>	R5

**Partners and Cooperators**

- NRCS
- CUSP
- Private Land Owners
- Municipal Water Providers (Denver Water, Aurora Water)
- NOAA – National Weather Service
- Park County Road & Bridge
- CDOT
- Park County Emergency Manager
- Colorado Department of Natural Resources
- Canyon Enterprises (Campground Concessionaire)
- City of Fairplay
- Ranch of the Rockies HOA

**H. Treatment Narrative:**

(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

**1) Land Treatments**

**LT-01 Agricultural Water Development (Spring) Stabilization**

- Treatment Type:
  - Slope stabilization for pipeline protection

- Grade stabilizers for spring collection systems
- Treatment Objectives: Provide stabilization of slopes for remaining pipeline protection, stabilize area around spring collection systems, protect around spring collections to allow for recovery
- Treatment Description:
  - Stabilize slopes for pipeline protection: Not all of the pipeline was destroyed. Pipeline that remains to deliver water from Painted Cup spring needs to be protected from erosion in places where it crosses slopes. Stabilization of the slope above the pipeline can be accomplished by perpendicular felling and log erosion barriers (LEBs). This can be used in combination with sandbagging of line to hold it in place.
  - Stabilize spring collection points: Install rock grade stabilizers around spring collections. Stabilizers will be placed perpendicular to line of flow. Use sizable material and keep low.
  - Protective fencing or barriers for spring collection point recovery: Install temporary sections of snow-fence to protect spring collections from animal intrusion and erosion.
  - See treatment map for treatment location.

AGRICULTURAL WATER DEVELOPMENT (SPRING) STABILIZATION				
LINE ITEM	UNIT	UNIT COST	# OF UNITS	BAER \$\$
Slope Stabilization for remaining pipe-line (LEB and sandbags): Labor/Equipment/Supplies (2-person crew)	Days	\$416	8	\$3,328
Install Grade Stabilizers for spring developments: Labor/Equipment/Supplies (2-person crew)	Days	\$316	3	\$948
Fleet	Month	341	5	\$1,705
Total Cost				\$5,981

## LT-02 Noxious Weed Early Detection and Rapid Response

- Treatment Type:
  - Treat known weed infestations
  - Conduct weed detection surveys
  - Treat newly found infestations based on detection survey findings
  - Protect native plant communities and noxious weed-free areas
- Treatment Objectives: Decrease noxious weed infestation/spread, provide early detection/rapid response of new infestations or species, protect currently weed-free areas and existing native plant communities, and allow for recovery.
- Treatment Description:
  - Treat known weed infestations: Treat known populations of weeds, including Canada thistle populations in the Antero Reservoir watershed (HUC12). These weeds are north of FSR 431, south of CR 22, west of Hwy 285 and east of FSR 432. There were no ground-disturbing activities that took place near existing populations of noxious weeds, so the immediate risk of spread through this exposure is low.
  - Conduct weed detection surveys: Determine the need for future treatments. Noxious weed surveys will be conducted to document increased noxious weed invasion occurring within the wildfire perimeter, concentrating in the areas of disturbance (fire suppression activities). Individuals conducting the survey/monitoring will be trained to recognize and treat noxious weeds and will treat any infestations encountered. Monitor all vectors including roads and drainages within the fire area for new infestations, as well as areas of moderate to high soil burn severity, and areas impacted by suppression and rehabilitation activities, such as bulldozer

- lines, helispots/heliports, drop points, and staging areas. Prioritize areas proximal to known infestations. Monitor in the spring as soon as ground is snow-free. Continue monitoring efforts throughout the subsequent growing season.
- Treat newly found infestations from detection surveys: Focus on priority species: Canada thistle and any new noxious weed species brought in from fire, suppression, or BAER activities.
  - Protection of clean areas: Since clean areas and current infested areas are known and mapped, it is feasible to separate these areas for recovery. Suggest coordination of private land owners on the north with NRCS to rebuild burned exterior fence to keep private livestock off FS lands (trespass prevention).

NOXIOUS WEED SURVEY/TREATMENT/PROTECTION OF CLEAN AREAS				
LINE ITEM	UNIT	UNIT COST	# OF UNITS	BAER \$\$
Treatment of Existing weeds: Labor/Equipment/Supplies (2-person crew)	Days	\$458	8	\$3,664
Detection: Labor/Equipment (1-person crew)	Days	\$133	65	\$8,645
Treatment of New weeds: Labor/Equipment/Supplies (2-person crew)	Days	\$458	10	\$4,580
Fleet	Month	\$341	5	\$1,705
Total Cost				\$18,594

#### LT-03 Cultural Resource Protection (Conceal with Slash)

- Treatment Type: Cultural resource protection
- Treatment Objectives: Reduce the risk of theft, damage, or loss of site integrity due to post-fire looting.
- Treatment Description: Place slash in and around cultural resource sites to conceal from public view.

Line Items	Units	Unit Cost	# of Units	BAER \$
Place slash at eligible cultural sites with unacceptable risk (2 person crew @ \$300/day)	Site	\$300	29	\$8,700

#### LT-04 Historic Land Survey Monument Protection

- Treatment Type:
  - Historic stone land survey monument location and protection
- Treatment Objective: Preserve existing land survey monuments that are at risk from the residual effects from the fire.
- Treatment Description:
  - Locate historic stone monuments using survey grade GPS.
  - Where necessary to ensure monument stability and longevity set a new monument in place of the existing historic stone monument.
  - Set a steel fence post along-side monument so that it can be easily identified.
  - Install erosion control measures to increase the durability and longevity of the monument.
  - Where necessary describe and record for future use.

Line Items	Units	Unit Cost	# of Units	BAER \$
Historic Stone Land Survey Monument Protection	Each	\$1,038	3	\$3,114

## 2) Channel Treatments

### CT-01 Channel Stabilization

- Treatment Type:
  - Riprap channel stabilization
  - Unauthorized route stabilization
  - Spillway culvert cleaning and riser installation
- Treatment Objectives:
  - Minimize or prevent impacts on hydrologic function and municipal water quality resulting from increased post fire flows creating a cascading failure of all three earthen dams at this location
  - Minimize risk for potential impacts to the life and safety of private homes directly downstream
- Treatment Description:
  - Riprap channel stabilization: Lower dam elevation and install 18" riprap to stabilize existing head-cut and dam outflow
  - Spillway culvert cleaning and riser installation: clean inlet of existing 18" CMP spillway culvert and install 6' culvert riser to prevent culvert plugging which would cause dam overtopping and potential breach
  - Unauthorized route stabilization: Lower elevation of unauthorized routes acting as water impoundments to minimize effects of cascading dam failures
  - See treatment map for treatment location

Treatment Item	Estimated Quantity	Unit	Unit Price	Cost
Channel Stabilization (Riprap) 3 locations	100	TON	\$ 97	\$ 10,000
Unplug spillway culvert and install 6' riser	1	UNIT	\$ 2,000	\$ 2,000
Unauthorized Road Stabilization (Install drainage dips)	2.5	DAY	\$ 1,200	\$ 3,000
<b>Total Cost</b>				<b>\$ 15,000</b>

### CT-02 Interagency Coordination

- Treatment Type:
  - Interagency coordination
- Treatment Objectives: Engage with collaborators and partners who are interested in providing funding for treatments within the Weston Pass burn area outside of the proposed BAER treatments. Specifically coordination with CUSP (Coalition for the Upper South Platte) and Denver Water.
- Treatment Description:
  - USFS hydrologist and engineer salary to provide expertise, support, and guidance in order to collaborate with key partners (CUSP & Denver Water) for treatments proposed outside the scope of this report. Specifically potential treatments include but are not limited to measures to permanently stabilize head-cuts located below Chicken Dip earthen dam (CUSP) and potential mulching to protect water quality in Antero Reservoir (Denver Water).

Treatment Item	Estimated Quantity	Unit	Unit Price	Cost
GS-11 Engineer or Hydrologist	15	DAY	\$ 350	\$ 5,250

		Total Cost	\$ 5,250
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### 3) Road, Trail, and Campground Infrastructure Treatments

#### RT-01 Storm-proofing (Roads, Trails, and Campground Infrastructure)

- Treatment Type:
  - Storm-proof roads
  - Storm-proof trails
  - Protect infrastructure (vault toilet & hand pump @ Buffalo Springs Campground)
- Treatment Objectives:
  - Minimize or prevent post fire impacts on selected NFS roads and trail prisms and drainage features
  - Minimize or prevent structural damage or infiltration of ash-laden flows into out-house vault and potable water hand-pump
  - Minimize or prevent impacts on soil and water resources resulting from increased post fire erosion and storm water runoff from roads and trails
  - Minimize risk for potential impacts to the life and safety of road and trail users
- Treatment Description:
  - Maintaining drainage features and road prism to accommodate increased post-fire runoff. This covers cleaning of ditches, re-crowning roadway, installing lead-outs, and cleaning culvert inlets/pipes.
  - Installing or enhancing drainage/rolling dips where necessary to divert increased post-fire flows off the road prism or to minimize diversion potential at existing culverts.
  - Removing existing culverts which are likely to be overwhelmed due to post-fire flows.
  - Installing natural fords at road/channel interaction points where post-fire increased ash and debris laden flows are likely to damage crossings and degrade water quality and hydrologic function downstream.
  - Armoring inlets and outlets of existing drainage structures where evidence from the 7/16 storm has shown the drainage structures will be overtapped and the road prism is vulnerable to erosion and/or total failure. This covers the placement of large riprap with a geotextile backing.
  - Attaining cultural clearance on segments of road where artifacts were witnessed to have washed down into the roadway prism during BAER team field recon.
  - Stabilize trail tread by outsloping and installing water-bars on segments likely to be eroded or washed-out by post-fire flows.
  - Stabilize vault toilet and hand-pump by protecting with sand-bags.
- Roads & Trails to be treated: 158, 168, 430, 431, 431.2B, 433, 433.2A, RAWS access road, trail 618 (see treatment map for specific treatment locations)

Road & Trail Storm-proofing	QTY	Rate (\$)	UOM	Total (\$)
Rolling Dip	12	250	Each	3000
Removal of Existing Culvert	1	815	Each	815
Install Natural Ford	3	1500	Each	4500
Culvert Inlet/Outlet Armoring (3)	55	100	Ton	5500
Rolling Dip w/Aggregate Surfacing	4	1000	Each	4000
Clean Ditch & Re-establish Crown (Level 3 Road)	4.9	700	Mile	3430
Clean Ditch & Re-establish Crown (Level 2 Road)	2.5	1400	Each	3500
Install Lead-outs	1	1000	Mile	1000
Flush Culvert	1	250	Each	250

Clean Culvert Inlet	4	100	Each	400
Cultural Clearances	1.5	1500	Mile	2250
Trail stabilization (outsloping/drain dips)	3	600	Day	1800
Contract Prep & Admin - Engineer (GS-11)	10	375	Day	3750
Contract Prep & Admin - Contracting Officer (GS-12)	2	475	Day	950
Mobilization	180	10	Mile	1800
Campground Infrastructure Stabilization (sand-bags)	50	16	Each	\$800
			Treatment Total	\$ 37,745.00

#### 4) Protection & Safety Treatments

##### PS-01 Temporary Area Closure

- Treatment Type:
  - Forest Closure
- Treatment Objectives:
  - The overall purpose of this treatment is to reduce risks to human life and safety by excluding Forest users from entering the burned area and experiencing injury, loss of life, or entrapment due to flooding, debris flows, and washed out roads.
- Treatment Description:
  - Implement and monitor Forest closure
  - Post closure order at road entry points and trailheads leading into the burn

Item	Unit	Unit Cost	# of Units	Cost
Post Forest Closure Order @ Trailheads & Roads	Each	\$200	12	\$2,400
Prepare Closure Order – LEO & GIS Staff	Day	\$350	2	\$700
Total Cost				\$3,100

##### PS-02 – Hazard Warning Signs

- Treatment Type:
  - Road warning signs
  - Trail warning signs
  - Campground site closure signs
- Treatment Objectives:
  - The overall purpose of this treatment is to reduce risks to human life and safety by warning motorists and/or Forest visitors of existing threats while traveling within and downstream of the burned area.
  - "Entering Burned Area" signs are needed to alert the public of possible threats to their life and safety that exist within or downstream of a burned area. The signs contain language specifying items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, and flash floods.
  - Campground site closure signs are necessary to prevent campers from unwittingly making camp within flood-prone areas.
- Treatment Description:
  - Warning signs will be necessary at all portals to the burned area including FR 431, 432, 433 as well as trailheads both within the burned area and outside the burn with trails leading into the burn from other Districts (see treatment map for locations).
  - Closure signs will be necessary to prevent Forest visitors from utilizing specific campsites within Buffalo Springs Campground which are prone to flooding and debris flows even after upland campsites have been deemed safe for public use.

<b>Burned Area Hazard Warning Signs</b>	<b>QTY</b>	<b>Rate (\$)</b>	<b>UOM</b>	<b>Total (\$)</b>
Road Burned Area Hazard Sign (36"x48"), posts, and hardware	3	300	Each	900
Campsite Closure Sign	10	200	Each	2000
Trail Burned Area Hazard Sign	8	200	Each	1600
<b>Burned Area Hazard Warning Signs Total</b>				<b>\$ 4,500.00</b>

#### I. Monitoring Narrative:

(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Treatment Effectiveness Monitoring: Monitoring of closures is needed to ensure that warning and closure signs are effective. Effectiveness monitoring for road, trail, and campground infrastructure storm-proofing treatments is also recommended to determine if treatments are working and if/when maintenance or repairs are required. Monitoring will be conducted by USFS staff.

Closure Effectiveness Monitoring	Days	\$260.00	15	\$3,900.00
Watershed Specialist/Engineer	Days	\$350.00	5	\$1,750.00
Road Treatment Monitoring (Back-hoe w/operator)	Days	\$1000.00	6	\$6,000.00
Campground Infrastructure Monitoring (GS-11)	Days	\$350.00	6	\$2,100.00
Trail Treatment Monitoring (2 person seasonal crew)	Days	\$300.00	6	\$1,800.00
<b><i>Subtotal Monitoring</i></b>				<b>\$15,550.00</b>

Part VI – Emergency Stabilization Treatments and Source of Funds      Interim # N/A

#### Weston Pass Fire BAER – Initial Request and Approval



PART VII • APPROVALS

1. Erin Connally  
Forest Supervisor (signature)

8/3/18  
Date

2. J.A. Bumgarner  
Regional Forester (signature)

8/13/18  
Date