

Date of Report: **May 21, 2013**
Interim #2**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 #2 Items are in Orange Font
☒ 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: Waldo Canyon B. Fire Number: CO-PSF-000728
C. State: CO D. County: El Paso
E. Region: Region 2 F. Forest: PSICC
G. District: Pikes Peak Ranger District H. Fire Incident Job Code: P2GY3N
I. Date Fire Started: June 23, 2012 J. Date Fire Contained: July 10, 2012
K. Suppression Cost: 7/18/2012 – \$16,686,000
L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): Dozer – 13.4; Handline – 3.2
2. Fireline seeded (miles): Dozer – 4.7
3. Other (miles): Improved Road – 36.2

M. Watershed Number:

Headwater Fountain Creek	110200030201
Cascade Creek - Fountain Creek	110200030203
Garden of the Gods	110200030204
West Monument Creek	110200030103

Lower Monument Creek	110200030107
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N. Total Acres Burned: 18,247

NFS Acres(14,422) DoD (147) Private (3,678)

O. Vegetation Types:

Vegetation	Acres
PONDEROSA PINE - DOUGLAS-FIR	3203
PONDEROSA PINE/GAMBLE OAK	2659
PONDEROSA PINE/GRASS	2632
DOUGLAS-FIR	1960
MX CONIFER - warm and/or dry	1941
ASPEN DOMINATED STANDS	1145
SHRUB - GAMBLE OAK DOMINATED	1106
MX CONIFER - cool and/or moist	877
RIPARIAN - TREE DOMINATED	731
SHRUB - MTN. MAHOGANY DOMINATED	206
PINYON-JUNIPER WOODLAND	186
GRASS/FORB/SUBSHRUB DOMINATED	163
BRISTLECONE/LIMBER PINES	52
SPRUCE-FIR	24
RIPARIAN - SHRUB DOMINATED	16
RIPARIAN - GRASS/FORB DOMINATED	6

P. Dominant Soils:

Sphinx (14,522 ac; 80%), Legault (863 ac; 5%), Herberman (587 ac; 3%), Tecolote (499 ac; 3%), Pendant (491 ac; 3%), many minor soils. Soils are dominantly gravelly to very gravelly coarse sandy loams on a wide range of slope gradients, with Pikes Peak granitic saprolyte substratum.

Q. Geologic Types:

MAP LABEL	GEOLOGIC DESCRIPTION	Acres
afa	Alluvial-fan deposit	160
agm	Alluvial gravel and sand (Verdos and Rock Flats Alluviums, undivided; early middle Pleistocene and early Pleistocene)	673
ags	Alluvial sand, silt, clay, and gravel (Louviere and Slocum Alluviums, undivided; late middle Pleistocene)	12
asa	Alluvial sand, silt, clay, and gravel (post-Piney Creek alluvium, Piney Creek alluvium, and pre-Piney Creek alluvium)	143

cbm	Carbonate-clast loamy colluvium	513
ccd	Calcareous clayey colluvium	198
cgh	Arkosic-clast loamy colluvium	39
cra	Hogback and range front colluvium, alluvium, and rock outcrop complex	928
csk	Grus, crystalline-clast colluvium, rock outcrop, and alluvium	15581
	Total	18247

R. Miles of Stream Channels by Order or Class:

Stream Type	Miles
Intermittent	96
Perennial	4

S. Transportation System

Trails: 8.68 miles Roads: 21.55 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Burn Severity	DoD	PVT	USFS	Grand Total	Percent
H		118	3,257	3,375	22%
M		1,419	5,867	7,286	41%
L	147	2,142	5,298	7,586	37%
Grand Total	147	3,678	14,422	18,247	100%

B. Water-Repellent Soil (acres):

Water repellency of moderate to high severity is widespread in the moderate and high soil burn severity classes (approx. 10,500 acres) and generally occurs from 1 to 4 inches depth (1-3 inch thick layer). It is most pronounced in the granitic derived soils. Repellency will be largely responsible for moderate soil burn severity being expected to have a high watershed runoff response. Widespread rilling and ash/litter/sediment movement has already begun from localized rain events in the fire area.

C. Soil Erosion Hazard Rating (acres):

HUC6 watershed

Cascade Creek-Fountain Cr

Garden of the Gods

Headwaters Fountain Cr

Lower Monument Cr

West Monument Cr

Total

('water' removed from total)

Low	Mod	High	V. High	Total	
153	52	1,582	496	2,282	13%
679	816	3,636	892	6,024	33%
199	17	1,867	303	2,386	13%
740	727	1,308	557	3,333	18%
1,733	193	1,858	406	4,190	23%
3,505	1,804	10,251	2,654	18,214	
19%	10%	56%	15%		

acreage)

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D. Erosion Potential:

Total fire area: On average 13 tons of material per acre (range 0.4 to 40) for a 10 year runoff event, as determined using WEPP-ERMiT. Note: Fairly localized data was utilized for building the ERMiT model (same geologic terrane). This generalized model often under predicts for this area. Stated model accuracy is +/- 50%; therefore +50% may be reasonably representative for this area.

ERMiT: 10 year runoff event

HUC6 watershed	Minimum	Maximum	Average
Cascade Creek-Fountain Cr	6.3	39.6	15.7
Garden of the Gods	0.4	34.4	12.8
Headwaters Fountain Cr	0.4	26.4	11.5
Lower Monument Cr	3.2	28.3	12.8
West Monument Cr	0.9	26.3	11.0
Grand Total	0.4	39.6	12.7

E. Sediment Potential:

Nearly 100% of erosion potential (see D. above) is expected to be delivered, due to steep slopes and stream gradients, and little topographic opportunity for re-deposition of sediments within the fire perimeter area.

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period, (years): 5-7
- B. Design Chance of Success, (percent): 50
- C. Equivalent Design Recurrence Interval, (years): 10
- D. Design Storm Duration, (hours): 1
- E. Design Storm Magnitude, (inches): 1.75
- F. Design Flow, (cubic feet / second/ square mile): 112.4
- G. Estimated Reduction in Infiltration, (percent): 60%
- H. Adjusted Design Flow, (cfs per square mile): 237.3

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The Waldo Canyon Fire burned along the urban interface of the westside of Colorado Springs, DoD Air Force Academy, Manitou Springs, Green Mountain Falls, Cascade, and Chipita Park. The fire burned as far north as Rampart Reservoir – major drinking water conveyance for the City of Colorado Springs. Approximately 13% of the HUC6 watersheds that drain into the urban interface are greater than 65% slope and dissected. Most of the precipitation in this area comes in the form of summer monsoon rain events (locally high rainfall rates in relatively short durations). The burn area is within management area 2B, 2A, 4B, and 5B as designated in the PSICC Forest Management Plan. Forest tree species that are present across the burn area are predominantly

mixed conifer which include: Ponderosa Pine (*Pinus ponderosa*), Douglas Fir (*Pseudotsuga menziesii*), Limber Pine (*Pinus flexilis*). On drier sites, shrub species include Pinyon pine (*Pinus edulis*), Juniper (*Juniperus scopulorum*), and Gambel Oak (*Quercus gambelii*). Scattered across the burned area are pockets of Quaking Aspen (*Populus tremuloides*), White Fir (*Abies concolor*), and Blue Spruce (*Picea pungens*).

Summary of Watershed Response

Watershed conditions in the burned watersheds have changed significantly as compared to pre-fire conditions. Vegetation and underlying organic matter slows runoff and protects soils from direct raindrop impact, assists with water infiltration to soil and releases runoff at slower rates. Consumption of organic material and high soil heating can promote the formation of water repellent layers, at or near the soil surface, which result in the loss of soil structural stability. The strength and depth of water repellency varies greatly by the duration and intensity of soil heating, type of organic matter consumed by the wildfire, and soil texture and moisture content. A “buried” water repellent layer was observed beginning at a depth of one inch to three or four inches below the soil surface based on the burn intensity and duration driving the water repellent layer deeper into the soil where the gases cooled, condensed on soil particles and remained buried. As a result of the Waldo Canyon Fire, the above described hydrologic function has been adversely affected and rates of runoff and sediment outputs are now significantly increased, particularly the first year after the fire.

Due to the steepness of these drainages and the amount of moderate and high burn severity and with large areas now devoid of vegetation and groundcover after the fire, the first large runoff producing storms will likely create increased surface flow volumes and velocities that can transport available sediment from the slopes and along the channel bottoms. This scenario coupled with existing wet antecedent soil conditions from previous storms could trigger a severe flood event with high sediment volumes.

Initial erosion of ash and surface soil during the first storm events will reduce slope roughness by filling depressions above rocks, logs, and remaining vegetation. The ability of the burned slopes to detain water and sediment will be reduced accordingly. This will aid in the potential for flashy floods and will increase the distance that eroded materials are transported. However, several factors favor a quick recovery in terms of normal hydrologic response of some hill slopes. The existence of fine roots in the low and moderate severity burn areas just below the surface will likely aid plant recovery, and suggests there still might be a seed source for natural vegetation recovery. The major concern for vegetative recovery and in turn hydrologic recovery is in the high severity burn areas.

Erosion Response

Pre-fire erosion on the average was calculated at 2.5 tons/ac across the 5 major 6th field watersheds (Fountain Creek Headwaters, Cascade-Fountain Creek, Garden of Gods (Camp Creek), West Monument Creek, and lower Monument Creek). Post-fire erosion jumped to 12.7 tons/ac from the pre-fire erosion rates. This equates to a 341% increase of sediment delivery across these five major watersheds.

On a sub-watershed basis, areas of special concern are Fountain Creek above Manitou Springs will have a 328% increase in sediment, Camp Creek (Queens Canyon) will have a 339% increase in sediment, and West Monument Creek (above the CSU filtration treatment plant) will have a 382% increase in sediment. These sediments will be delivered to streams and increase bulking potentials of anticipated flows (see Soil’s Specialist Report for details).

Geologic Response

Past geologic hazards are mapped and presented in summary form, sourced from the State of Colorado Geological Society: many different types of geologic hazards, such as landslides, debris flows, swelling soils, and rockfall are present within the Cascade quadrangle. Landslides and swelling soils are the most common and most costly hazards in the eastern urbanized area, potentially accounting for millions of dollars in property loss and damage (Noe and others, 1997; Himmelreich and Noe, 1999; Himmelreich, 1996; City of Colorado Springs Office of Emergency Management Homepage, 2003).

Landslides

Many landslides are located in the Cascade quadrangle. The largest one lies along Highway 24, about 0.25 mi southeast of the town of Cascade along the eastern margin of French Creek (SE1/4 sec. 26, T. 13 S., R. 68 W.). This large and complex pre-historic slide-flow deposit covers an area of at least 0.42 mi and is outside the fire perimeter.

Both prior to and as a result of the 1999 storms, landslide damage has occurred in the Cedar Heights subdivision, west of Garden of the Gods Park (sec's. 28, 29, 32, 33, T. 13 S., R. 67 W), where the Glen Eyrie Shale Member of the Fountain Formation is accountable for both old and active landslides.

The Mountain Shadows subdivision (sec. 22, T. 13 S., R. 67 W) is built upon shale, limestone, and sandstone overturned by Laramide movement on splays of the Rampart Range fault zone that pass beneath the neighborhood. This area was previously mapped as earthflow, colluvium, and landslide deposits (Trimble and Machette, 1979; Scott and Wobus, 1973; Himmelreich and Essigmann, 1980).

North of the Mountain Shadows subdivision, landslides in the Pierre Shale locally affect Qg2 gravels. Numerous landslides have occurred in the Pikeview Quarry (sec. 9, T. 13 S., R. 67 W.) as a result of mining operations exposing dipping carbonate layers of the Manitou Limestone (Himmelreich, oral communic. to Pikes Peak Ranger District, 2001).

Most of the landslides mapped in the Peregrine subdivision (sec's. 3 and 4, T. 13 S., R. 68 W) are derived from the Pierre Shale and other Cretaceous rocks (Himmelreich, unpublished maps). In addition, other small (not mapped) landslides occur in the quadrangle, and soil slumps have developed on road cuts along Woodmen Road near Dry Creek in the Peregrine subdivision (J. White, oral communication, 2003).

Two landslides (sec. 21, 28 T. 12 S., R. 67 W.) located along the westernmost boundary of the U.S. Air Force Academy are also derived from the Pierre Shale. They contain cobbles and boulders of Qg2 gravels, subrounded fragments of Pikes Peak Granite, and buff-colored fragments of Dawson Formation. These landslides themselves contain localized debris flows and slumps.

Debris Flows

Debris flows are heterogeneous mixtures of mud, rock fragments, and plant materials that commonly form in the lower parts of tributary streams as they enter a large valley (Rogers and others, 1974). As the debris flow moves down its valley, unconsolidated surficial material is incorporated into the flow until the suspended sediment is no longer confined and is released as a fan-shaped deposit at the mouth of the tributary stream. Debris flows are the result of torrential rainfall or very rapid snowmelt runoff, where sediment supply is abundant and easily mobilized (Selby, 1993). Hazard analysis should take into account denuded forest conditions, such as after a wildfire (FEMA, 1999; White, 1999). Such conditions may exist in areas mapped as alluvial fans (Qf), colluvium and sheetwash (Qcs), and landslides (Qls), or in areas where crystalline bedrock units are weathered to grus.

Deposits formed by debris-flow activity have been recognized and reported within the quadrangle in the Mountain Shadows and Peregrine subdivisions (Bass and Himmelreich, 1987; Himmelreich and Essigmann, 1983; Himmelreich, 2000). Several techniques are available for the mitigation of debris flows. These include construction of debris basins (to be cleaned after each flow event), channelization and/or diversion of runoff, protective structures, debris-catching devices, and structures with significant clearance. Most such structures for debris flow mitigation require considerable engineering, and are relatively permanent in nature, so they are generally not suitable as BAER treatment recommendations.

Rockfall

Rockfall deposits are grouped into the colluvium and sheetwash deposits (Qcs) on the accompanying geologic map. While rockfall deposits were not very extensive or of great thickness, they represent a significant hazard in the map area where hogbacks are located near urban development. Sections of U.S. Highway 24, where Fountain Creek passes through Precambrian Pikes Peak Granite and forms steep-walled cliffs, are in an area

of significant rockfall hazard. These slopes carry a “high” rating in the Colorado Department of Transportation Rockfall Rating System (J. White, personal communication, 2003). Very large granite boulders, some exceeding 15 feet in diameter, are found along the highway, along with smaller boulders, cobbles, and fan deposits.

Trails:

There are two system trails impacted by burned area:

- Rampart Reservoir Trail (Trail 700)
- Waldo Canyon Trail (Trail 640)

The Rampart Reservoir Trail is a popular multi-use recreation trail, with an estimated 75,000 users per year on the shoreline of Rampart Reservoir. Total trail length is 16.5 miles with 2 segments, totaling approximately 1.25 miles, on the south shore impacted by the burned area. The 3,000 lineal feet of moderate severity burned slope above the trail will increase runoff and sediment transport across the trail. There are four defined drainage channels that intersect the trail with potential to damage trail tread, as a result of increased flows and sediment transport post burn.

The Waldo Canyon Trail is a high use trail (135,000 users per year; over three hundred users per day) 6.5 miles in length, starting at Highway 24 north of Manitou Springs. The trail traverses private property for approximately 0.7 miles above Highway 24 then enters USFS property and the Waldo Canyon drainage. At 1.5 miles the trail splits north into Waldo Canyon and east toward Williams Canyon with the two segments connecting at the ridge line between the two drainages, creating a 3.5 mile loop. The first 1.5 miles of trail from Highway 24 has small pockets that are impacted by burned area that will see increased runoff from burned slopes. The east part of the loop (towards Williams Canyon) crosses steep slopes with moderate soil burn severity that may impact the trail, but is high in the canyon so it avoids major drainage crossings. The westerly segment of the loop follows the Waldo Canyon drainage and crosses the active channel numerous times before ascending east to the ridgeline between Waldo Canyon and Williams Canyon. The trail's specialists observed that the channel has already experienced ash and sediment flows that have crossed the trail and caused damage. The entire section of trail in Waldo Canyon will see significantly increased runoff and sediment, with the drainage crossings seeing severe impact from increased runoff and sediment laden flows. The trail's specialists also observed two sections of the trail where wooden stair structures have been burned leaving the trail in a potentially unsafe condition. There is a high risk of trail failure which will add to erosion and sediment transport and resultant deterioration of the watershed. The Waldo Canyon trail head parking lot has been closed with concrete barriers and should remain closed until the trail is determined safe to reopen.

Recreation Facilities:

Recreation facilities impacted by burned area include:

- South Rampart Shooting Range (temporary closure implemented pre-fire)
- Thunder Ridge Campground
- Meadow Ridge Campground
- Promontory Picnic Area
- Aspen Grove Interpretive Trail

South Rampart Shooting Range is located along Rampart Range Road (Section 20, Township 13S, Range 67W). There are large areas of fired shells on a hillside within a burned drainage. We anticipate increased runoff and sediment flows across this hillside, coupled with the deterioration of the shells caused by the burn, which may accelerate transportation of potential contaminants. A full analysis of contaminants and cleanup of the area is planned for fall 2012.

Thunder Ridge Campground, Meadow Ridge Campground, and Promontory Picnic Area are developed sites located above the south shore of Rampart Reservoir and are within the burned area. The structures at these

sites are not damaged, the primary concerns at these facilities are hazard trees that could damage facilities and threaten human life/safety.

Aspen Grove Interpretive Site is located in the vicinity of the campground and picnic area on the south side of Rampart Reservoir. The structures within this site are damaged by the burn and are unsafe.

Natural Resources:

Wildlife

Species federally listed as *threatened*, and the *critical habitats* of these species are located within and/or in proximity to the Waldo Canyon Fire burned area. These species include the Mexican spotted owl (*Strix occidentalis lucida*) and Preble's meadow jumping mouse (*Zapus hudsonius preblei*).

Mexican Spotted Owl

Mexican spotted owl *designated critical habitat* occurs within the perimeter of the Waldo Canyon Fire. The breeding habitat of this species occurs within or adjacent to the southeastern portion of the Waldo Canyon burn area within the vertical and horizontal landscape structure of Queens Canyon and Williams Canyon. These canyons possess the habitat features/primary constituent elements associated with spotted owl occupancy, as evidenced by a historic specimen collection of this species from this site.

The Waldo Canyon Fire resulted in a reduction in the extent and suitability of spotted owl breeding habitat within Queens Canyon and Williams Canyon. An estimated 416 acres of suitable spotted owl breeding habitat within Queens Canyon (190 ac.) and Williams Canyon (226 ac.) were burned during this event. Burn severity within nesting features (i.e. canyon wall crevices/ledges) was minimal, while associated forested features varied from moderate to severe. This wildfire also resulted in a substantial loss in habitat essential to the recovery of this species as approximately 20% of designated *critical habitat* on the district was burned.

Potentially more frequent and higher magnitude flood events generated from the burned area may further degrade residual habitat, as well as impact the unburned suitable habitat of this species within these canyons. An estimated 5,800 feet (1.1 mi.) of riparian vegetation is at risk of being inundated with sediment. About 1,584 feet (0.3 mi.) of this vegetation occurs on National Forest System land along Camp Creek. High flows and sediment deposition may degrade or eliminate the unburned riparian vegetation within these canyons, which function as sources of fruit and seed for prey species. This residual plant cover is an important component of the mosaic vegetation communities associated with spotted owl breeding habitat.

Preble's Meadow Jumping Mouse

The suitable habitat of this species occurs within or adjacent to the eastern and southern perimeter of the Waldo Canyon burn area along West Monument Creek, Camp Creek, Williams Canyon, Waldo Canyon, and Wellington Gulch. Suitable habitat also occurs intermittently along several miles of Fountain Creek within the communities of Chipita Park and Cascade and cities of Manitou Springs and Colorado Springs. Habitat occupied by this species occurs on the US Air Force Academy along West Monument Creek, about 1 mile downstream of National Forest System land. Occupied habitat extends 3.6 miles from West Monument Creek and Monument Creek into critical habitat designated within the City of Colorado Springs.

The Waldo Canyon Fire resulted in a reduction in the extent and suitability of Preble's habitat within several drainages. An estimated 1,162 feet (0.2 mi.) of suitable habitat was burned during this event. About 528 feet (0.1 mi.) of this habitat occurred on National Forest System land along Camp Creek within Queens Canyon. Burn severity within the impacted habitats was generally moderate. The magnitude of offsite impacts to the habitat of this species will vary depending on flood event intensity and location.

Habitat conditions within Williams Canyon, Waldo Canyon, and Wellington Gulch are adequate to support this species but due primarily to urban development, are less developed and extensive than known occupied sites. West Monument and Monument Creeks contain high quality habitat in the form of well-developed riparian areas with adjacent, relatively undisturbed grassland communities. Impacts to occupied sites or habitat within these creeks may be detrimental to individual Preble's and the habitat that is essential to the recovery of this species. High magnitude flood events generated from the burned area may directly destroy nest sites, food resources, and hibernation sites of this species. These events may also result in changed channel structure

and lead to stream entrenchment, floodplain abandonment, and loss of riparian vegetation that obstructs habitat connectivity and facilitates the colonization of invasive plant species.

Botany

The Regional Forester has identified sensitive species for Region 2, and the Pike and San Isabel National Forests, and Cimarron and Comanche National Grasslands has further refined this list, to include only those species with the potential to occur within its administrative boundaries. Following review of the Colorado Natural Heritage Database (2011) and available Forest information, we have determined that there are no documented occurrences of any federally endangered, threatened or proposed plant species, or any Regional Forester Sensitive Species within the proposed treatment area, and there is no habitat for any of these species; or if species or their habitat is present, it would not be affected by project implementation.

Because there are no records or habitat for any federally endangered, threatened or proposed species, the proposed treatments will have no direct, indirect or cumulative effects on these species due to erosion, sedimentation, or fire suppression activities.

Invasive Weeds

There are many disturbance sites within the perimeter of Waldo Canyon Fire, including an extensive road and trail system, developed recreation sites, shooting areas, and private land developments. Based on invasive weed infestations in other portions of the Pike National Forest, the burned area is assumed to have a 1% existing infestation rate. The ecological integrity of native plant communities in the burned area is at risk from introduced invasive species and expanding invasive weed populations. Several priority species were identified that have the potential to adversely affect the native plant communities in the fire area. Many of these species are designated as eradication species according to the *Colorado Department of Agriculture Noxious Weed Law*. Areas disturbed by the wildfire and associated suppression resulted in substantial soil disturbance throughout the burned area and are highly vulnerable to invasive weed introduction and spread. Sources of new ground disturbance include hand line, dozer line, staging areas, safety zones, camps, helicopter drop points, fuel breaks, and stream crossings. New invasive weed occurrences or an expansion of existing populations are likely to occur in these disturbed sites or from introduced material during this fire event. Increased runoff, soil rilling and sediment flows will also affect portions of roads, trails, and drainages in the fire area. Each impacted site may provide the conditions that facilitate invasive weed expansion. Specific weed species are listed in the Invasive Weeds specialist report.

Values at Risk:

The risk matrix below, Exhibit 2 of Interim Directive No.: 2520-2012-1, was used to evaluate the Risk Level for each value identified during Assessment. Additionally more information on the values at risk by watershed that are driving treatments can be found in the Appendix.

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High	Very High	Low
Likely	Very High	High	Low
Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

Life:

There is an imminent threat to human life within and adjacent to burned watersheds on the Waldo Canyon Fire.

Hazard trees that posed an imminent threat along the road corridor and within the campground facilities were identified with flagging and mitigated using available fire crew members still attached to the incident. There is still a risk that hazard trees exist in areas where implementation will occur.

Road/Stream crossings

There are multiple road/stream crossings within and immediately downstream of the burn area.

Risk Assessment – Threats to travelers on State Highway 24, primary roads critical for ingress and egress of emergency services and evacuations, and Forest Roads.

Probability of Damage or Loss: Very Likely. Low water crossings/flash flood risk.

Magnitude of Consequence: Major. Possible injury or death as a result of infrastructure failure, or flash flooding.

Risk Level: Very High – Hillslope and other treatments recommended to reduce flooding and sediment potential.

Primary residences at outflow of canyons

There are houses at the outflow of almost every watershed around the burn.

Risk Assessment – Threats to residents in these structures

Probability of Damage or Loss: Very Likely – risk from flooding greatly increased and history of past flooding

Magnitude of Consequence: Major. Possible injury or death as a result of infrastructure failure, or flash flooding.

Risk Level: Very High – Hillslope and other treatments recommended to reduce flooding and sediment potential.

Campgrounds near Rampart Reservoir

There are several campgrounds on the District within the burn area that are at increased risk from burned infrastructure, hazard trees and erosion.

Risk Assessment – Threats to Forest users

Probability of Damage or Loss: Likely – risk from hazard trees

Magnitude of Consequence: Moderate – possible injury

Risk Level: High – Treatments recommended to reduce threat to life and safety

Forest users on Waldo Canyon trail

Waldo Canyon Trail is a risk to users from rockfall and hazard trees.

Risk Assessment – Threats to Forest users

Probability of Damage or Loss: Very Likely – compromised trees due to burn

Magnitude of Consequence: Moderate – possible injury to users and personnel

Risk Level: Very High - Treatments recommended to reduce threat to life and safety

Property:

Forest Service System Roads (NFSR)

FS roads exist throughout the burn area (main travel route is Rampart Range Road - FSR300) and there is a risk to the roads and crossings from increased runoff, associated sediment and debris, and debris flows.

Risk Assessment – Threats to Forest Roads

Probability of Damage or Loss: Likely – multiple crossings and parallel sections in the floodplain

Magnitude of Consequence: Moderate – water could channel down road with possible wash outs and there is a potential for crossings to be damaged or destroyed.

Risk Level: High – Reinforce drainage structures and implement Storm Response.

Primary residences at outflow of canyons

There are houses at the outflow of almost every watershed around the burn.

Risk Assessment – Threats to private property (homes and infrastructure)

Probability of Damage or Loss: Very Likely – risk from flooding greatly increased and history of past flooding

Magnitude of Consequence: Major – possible inundation of structures and damage to outbuildings.

Risk Level: Intermediate to Very High – hillslope treatments – coordinate with NRCS so that they can address specific landowner needs.

Forest Campground and Picnic area facilities

Infrastructure in campgrounds and picnic areas were not damaged, however there is increased risk of hazard trees and also adjacent burned area poses a risk. Infrastructure at Apsen Grove interpretive site is damaged from burn.

Risk Assessment – Threats to Forest users

Probability of Damage or Loss: Likely – compromised trees due to burn adjacent to sites

Magnitude of Consequence: Moderate – possible damage to property and injury to users and personnel

Risk Level: High – monitor hazard trees and remove as necessary, post warning sites for burned areas, close individual campsites as necessary, remove damaged infrastructure at interpretive site

Forest Users

There exists a threat to Forest Users from hazard trees, interior hot spots, flooding, increased possibility of road/trail damage and flooding.

Risk Assessment – Threats to Forest users

Probability of Damage or Loss: Likely – compromised trees due to burn adjacent to sites

Magnitude of Consequence: Moderate – possible damage to property and injury to users and personnel

Risk Level: High – monitor hazard trees and remove as necessary, post warning sites for burned areas, close individual campsites as necessary, remove damaged infrastructure at interpretive site

Natural Resources:

Native Plant community

New invasive weed occurrences or an expansion of existing populations are likely to occur in disturbed sites from introduced material during this fire event. During fire suppression, an estimated 210 acres of new disturbances were created from a combination of dozer and hand line, fuel breaks, landings, camps, and drop points. Increased runoff and sediment flows will affect portions of roads, trails and drainages in the fire area. Each impacted site may provide the conditions needed for invasive weed expansion.

Risk Assessment – Probability of damage or loss of the native plant community

Probability of Damage or Loss: Very Likely - suppression activities resulted in substantial soil disturbance throughout the burned area.

Magnitude of Consequence: Moderate – new disturbances generated from a variety of sources; equipment may have introduced invasive species.

Risk Level: Very High – the ecological integrity of native plant communities in the burned area is at risk from introduced invasive species and expanding invasive weed populations.

Mexican Spotted Owl

The wildfire resulted in a substantial loss in habitat that is essential to the recovery of this species, as about 20% of the critical habitat on the district was burned during this event. An estimated 5,800 feet of riparian stands are at risk within Queens and Williams Canyons. About 1,584 feet of this riparian vegetation occurs on National Forest system lands. These riparian areas are an important component of the mosaic vegetation communities associated with spotted owl breeding habitat and are considered a primary constituent element of critical habitat.

Risk Assessment - probability of damage or loss of spotted owl habitat

Probability of Damage or Loss: Likely - unaffected riparian stands are located immediately adjacent to the burned area.

Magnitude of Consequence: Major - probable adverse impacts to the critical habitat of this federally listed species.

Risk Level: Very High - the fire resulted in a reduction in the extent and suitability of spotted owl breeding habitat. Residual critical habitat is at risk of being damaged or lost.

Preble's Meadow Jumping Mouse

The wildfire resulted in a reduction in the extent and suitability of this species habitat within several drainages. An estimated 462 acres of occupied habitat is at risk within West Monument and Monument Creeks on the US Air Force Academy. Critical habitat is also designated on about 274 acres of Monument Creek within the City of Colorado Springs. Impacts to occupied sites or habitat within these creeks may be detrimental to individual Preble's and the habitat that is essential to the recovery of this species.

Risk Assessment - probability of damage or loss of Preble's meadow jumping mouse habitat

Probability of Damage or Loss: Possible - unaffected riparian habitat is located adjacent to the burned area; occupied habitat is located about 1 mile downstream of the burned area.

Magnitude of Consequence: Major - possible adverse impacts to individual Preble's meadow jumping mouse and the critical habitat of this federally listed species.

Risk Level: High - the fire resulted in a reduction in the extent and suitability of Preble's habitat in several drainages. Species is closely associated with riparian ecosystems that are linear in nature and represent a small percentage of the landscape.

Cultural Resources:

Archaeology – There is one Class I heritage site that is subject to loss of integrity as a result of the Waldo Canyon fire. The site is bisected by Forest Service Road 305 and consists of historic mining operation site. This site has features at risk of damage from erosion (see the Heritage Specialist Report for specific details) and looting.

Risk Assessment - probability of damage or loss of artifacts

Probability of Damage or Loss: Likely – from heavy water runoff and from looting

Magnitude of Consequence: Major – loss of information related to mining on the Pike

Risk Level: Very High

Risks: The full list of values at risk is included in the Appendix and the VARs are listed by watershed.

B. Emergency Treatment Objectives:

As noted above, threats to life, property, and natural and cultural resources from loss of water control, increased sediment delivery, increased debris flow potential, establishment of invasive weeds, and habitat degradation for Federally Threatened species exist as a result of the Waldo Canyon Fire. For these reasons the primary treatment objectives are:

- Mitigate effects of changed post-fire watershed response on human life and safety, particularly where Forest roads, bridges, and cross drainages are at risk of damage and where flash flood, debris flows present a hazard to recreationists (hikers, bikers and equestrian trail users) and communities adjacent to NFS lands.
- Mitigate effects of changed post-fire watershed response on Forest Service developed sites such as campgrounds and administrative sites.
- Mitigate effects of changed post-fire watershed response on the historic properties and cultural resources.
- Mitigate effects of changed post-fire watershed response on natural resources such as Federally listed Mexican Spotted Owl and Preble's Jumping Mouse.

- Minimize the increased potential for the spread of invasive and invasive weeds.
- Mitigate effects of changed post-fire watershed response on long-term hydrologic function.

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

Land 65 % Channel N/A % Roads/Trails 75 % Protection/Safety 90 %

D. Probability of Treatment Success:

	Years after Treatment		
	1	3	5
Land	75	80	90
Channel	N/A	N/A	N/A
Roads/Trails	80	85	95
Protection/Safety	85	90	95

E. Cost of No-Action (Including Loss): Critical values would be lost. See attached VAR tool.

F. Cost of Selected Alternative (Including Loss): See attached VAR tool.

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input type="checkbox"/> Range
<input checked="" type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS

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Team Members:

Public Information – Cathleen Thompson, Courtney Wood(t)

Interagency Liason – Steve Sanchez

Administrative Assisstant – Colleen Oquist

Hydrologist – Mary Moore, Dave Park

Soil Scientist – Dave Young, Brad Rust

GIS – Molly Purnell, Ed Biery

Engineering – Judy Kittson, Cait Cuddihy

Wildlife – Felix Quesada

Noxious Weeds – Denny Bohon

Botany – Steve Olson

Arcaeology – Priscilla Riefkohl, Clint Dalton

Forester – Adam LaSalle, Sam Schroeder (adjunct)

Recreation – Frank Landis

Lands and Special Uses – Jeff Hovermale

H. Treatment Narrative:

Land Treatments: **Items are in Orange Font for Interim #2**

Treatment Type – The primary treatment recommended for implementation is aerial mulching (application of wood shred and agricultural straw) of upland slopes that are 60 percent or less.

Treatment Objective: The treatment objectives focus on the reduction of potential soil erosion/sediment yield and runoff onto over steepened mid-elevation slopes that, despite containing elevated high and moderate burn severity, have little to no treatment options. This may lessen the overall threat to downstream life and property from increased sediment load and flows.

If additional acres on non-federal land in the burn areas are treated as well, a decrease in flows and sediment can be expected. This treatment's primary benefit is for the protection of life with secondary benefits to protect Forest Service infrastructure and natural and cultural resources.

Treatment Description: The prescribed treatment is an aerial application of woodshred and agricultural straw on upland slopes of the burn area. Appendix B contains the treatment analysis. The woodshred would be produced onsite with recently burnt trees that are dead or will be dying off in the next 3-5 years. Woodshred will be a more effective treatment in high wind prone areas on the steep slopes and on ridge tops. Ag straw will fill in the remainder of the treatment polygons.

Table 1 lists the number of treatable acres on private and USFS lands. Appendix B of the hydrology specialist report describes the treatment analysis in detail. Aerial application of woodshreds and agricultural straw will be applied to hillslopes between 25% and 60% where such treatments can be most effective. These treatments will facilitate stabilization by dissipating raindrop impact, trapping sediment and water, improving infiltration, increasing the flowpath distance of water occurring as overland flow, and providing a seedbed and improved microclimate for revegetation.

Table 1: Treatable acres

HUC6 - Treatable Acres	PRIVATE	USFS	TOTAL
Cascade Creek-Fountain Creek	156	606	762
Garden of the Gods	80	1098	1178
Headwaters Fountain Creek	53	368	421
Lower Monument Creek	245	448	693
West Monument Creek		678	678
Grand Total	534	3198	3732

One thousand hillslope acres on NFS lands have been identified to be treated with woodshreds at a cost of \$2,200,000. Another 2198 hillslope acres on NFS lands have been identified to be treated with agricultural straw at a cost of \$2,637,600. Table 2 summarizes these data along with the unit cost for each treatment.

Table 2: Hillslope Treatment Costs

Treatment	Unit	Cost
Woodshred (\$2200 per Acre)	1000	\$2,200,000.00
Ag Straw (\$1200 per Acre)	2198	\$2,637,600.00
Total	3198	\$4,837,600.00

Interim #1

The Implementation Team conducted a post assessment. This process included field verification of the treatment units. Based on the terrain, slope, and local wind patterns the number of woodshred acres was increased to 1,958 and the agricultural straw acres were decreased to 1,080. 160 acres were dropped due to needle cast, rock outcroppings, and natural regeneration of vegetation. The Implementation Team received aerial helimulching bid proposals. Each proposal was rated based on the company's organizational experience, past performance, and understanding of the government's requirements. A contractor was selected based on an excellent performance. The amount of onsite material for the woodshred units was approximated at 1,000 acres during the assessment. The contractor identified the need to import wood from local resources to meet the needs of the contract. The contract cost was \$4,783,918. The post assessment implementation team cost was approximately \$50,000. This leaves a remainder of \$3,682 to administer this contract. This contractor has 30 days to complete this contract from the time of award. Additional cost are need to support the team of individuals need to administer this complex contract for 30 days. That is an additional cost of \$344,296.

The total acres for this project are 3,038 acres; 1,958 acres of woodshred and 1,080 acres of Ag Straw. The contract cost was \$4,783,918.00. The post assessment team cost was approximately \$50,000.00 and the contract administration team cost is \$348,000.00 for a total of \$398,000.00. The new cost per acre for woodshred helimulching application and overhead is \$2272.00. The new cost per acre for ag straw helimulching application and overhead is \$679.00. Bringing the total project cost to \$5,181,896.00. That is an additional cost of \$344,296.

Interim #2 - Treatment

The interim request is to work in the highest priority areas that we can complete work by July 10, 2013. This interim is the result of field verification of hillslopes, floodplains and channels in the Waldo Burn Area. We cannot change the hydrology, but we can change how our watersheds handle the increased flows.

Emergency work is needed in the Williams Canyon, Waldo Canyon and Camp Creek Watersheds, in that priority order. These are watersheds that will lose the most soil according to the WARSSS assessment that determined tons of sediment delivered from both hillslopes and channels. These watersheds are a very high threat to life and property damage along the Highway 24, the City of Manitou Springs, Glen Eyrie and the 30th Street – Pleasant Valley neighborhoods.

There is quite a bit of work being down right now by partners and our work will help support the success of their efforts. Along Highway 24, CDOT is spending over 5 million dollars on flood preparation between Manitou Springs and Green Mountain Falls, and at the mouth of Waldo Canyon. Glen Eyrie has spent over a million EWP dollars at the mouth of Camp Creek. CUSP is working with the NRCS to implement EWP projects that include sediment detention basins and hillslope stabilization along the Highway 24 corridor and throughout the burn area. Williams Canyon flows into downtown Manitou Springs and floods in 1999 when the watershed was intact caused millions of dollars of damage. In other parts of the burn, the City of Colorado Springs, NRCS and Colorado Springs Utilities are working to stabilize hillslopes and stream channels. The attached map shows the watersheds on USFS managed lands where Colorado Springs Utilities is spending over \$5 million in 2013.

The proposed USFS work in interim #2 will help stabilize hillslopes and floodplains allowing for better flood flow dispersal and decreased degradation. Pike National Forest experience from the 2002 Hayman Fire and RMRS research validates the need for treatments to reduce persistent threats from wildfires in this soil type. The flood flows have persisted in the Hayman Burn area for over ten years.

Additional landscape treatments are needed for the reduction of potential soil erosion, sediment yield and storm runoff. Additional landscape treatments include: channel stabilization to prevent additional head cutting, down cutting and lateral migration; hill slope stabilization to stabilize and prevent additional

rilling/gullying/erosion; below grade sediment detention basins to capture sediment and flood debris; and buried log sills across the floodplain to prevent down cutting and dispersing flood flows.

Hand treatments include utilizing burnt trees as directional felling to break up concentrated flows in existing rills, in some cases straw wattles or raking and seeding with native seed at existing rills will be utilized, and burnt trees will be utilized to stabilize headcuts. Some of the handwork identified are within the 2012 aerial mulching treatment polygons that have received a 2 inch rain event in August and now ineffective. Handwork is proposed as a retreatment in these areas to target the worst sites and to be the most efficient.

The cost of sediment detention basins varies by the difficulty of access. The treatment cost summary table outlines the estimated costs. At the mouth of Waldo Canyon, there is easy access off of Highway 24 – so the sediment detention basins are estimated to cost less than in Williams and Waldo where a temporary access road is necessary.

Hill Slope Stabilization and Debris Basin Installation

Hand crews will complete hillslope stabilization treatments on 260 priority acres where it has been determined that additional stabilization work is necessary. There are 24 priority locations where debris basins would help support existing emergency response efforts. Debris basin installation has been an effective treatment in the Pikes Peak granite to reduce flood and debris flow risks and threats to life and property. The cost includes temporary access and restoration of access to remote sites.

Watershed	Item	Unit	# of Units	Unit Cost	Total
Williams Creek	Rill/ Hill Slope Stabilization - hand work	acres	46	\$1,200	\$55,200
	Retreat Hill Slope Stabilization	acres	14	\$1,200	\$16,800
	Debris Basin Installation	unit	12	\$40,000	\$480,000
Waldo Canyon	Rill/ Hill Slope Stabilization - hand work	acres	42	\$1,200	\$50,400
	Retreat Hill Slope Stabilization	acres	123	\$1,200	\$147,600
	Debris Basin Installation	unit	6	\$20,000	\$120,000
Camp Creek	Rill/ Hill Slope Stabilization - hand work	acres	9	\$1,200	\$10,800
	Retreat Hill Slope Stabilization	acres	25	\$1,200	\$30,000
	Debris Basin Installation	unit	6	\$50,000	\$300,000
Support	Cultural Clearance		1	\$15,000	\$15,000
	Implementation Team Lead	Day	50	\$350	\$17,500
	Hydrology Support for hill slope/hand work		20	\$400	\$8,000
New Treatment Total	\$1,056,900				
Re-treatment Total	\$194,400				
	Interim #2 Total				\$1,251,300

Interim #2 - Values at Risk

Life:
There is an imminent threat to human life within and adjacent to burned watersheds on the Waldo Canyon Fire. The interim #2 report is in response to the following values at risk.

Road/Stream crossings

There are multiple road/stream crossings within and immediately downstream of the burn area.

Risk Assessment – Threats to travelers on State Highway 24, primary roads critical for ingress and egress of emergency services and evacuations, and Forest Roads.

Probability of Damage or Loss: Very Likely. Low water crossings/flash flood risk.

Magnitude of Consequence: Major. Possible injury or death as a result of infrastructure failure, or flash flooding.

Risk Level: Very High – Hillslope and other treatments recommended to reduce flooding and sediment potential.

Primary residences and towns at outflow of canyons

There are houses at the outflow of almost every watershed around the burn. The towns of Cascade, Green Mountain Falls, Chipita Park, and Manitou Springs will see benefit from these treatments.

Risk Assessment – Threats to residents in these structures

Probability of Damage or Loss: Very Likely – risk from flooding greatly increased and history of past flooding

Magnitude of Consequence: Major. Possible injury or death as a result of infrastructure failure, or flash flooding.

Risk Level: Very High – Hillslope and other treatments recommended to reduce flooding and sediment potential.

Cultural Resource Protection:

Heritage Sites – To maintain site integrity and allow for vegetation regrowth, wood shred will be placed by aerial mulching over historic mining site (5EP6847), with artifact concentrations at risk. Aerial mulching costs are included in the hillslope treatment section. See the Heritage Specialist Report for complete details of specific site implementation.

Native Vegetation:

The prescribed treatments for invasive weeds are designed to help protect the ecological integrity of native plant communities in the burned area that may be at risk from expanding invasive weed populations. The treatments are designed to prevent and reduce the spread of these invasive species, which was determined to be a very high risk. The first year costs for detection surveys and treatment is \$26,192.

Detection Surveys				
Item	Unit	Unit Cost	# of Units	Cost
GS-11	Days	\$350	5	\$1,750
2 x GS-05	Days	\$326	20	\$6,520
Supplies	Each	\$1000	1	\$1,000
Ag straw testing	Each	\$60	3	\$180
Per Diem / Travel (field rate)				\$845
Total Cost				\$10,295

Treatment Contract				
Item	Unit	Unit Cost	# of Units	Cost
GS-11	Days	\$350	7	\$2,450
1 GS-05	Days	\$163	5	\$815
Herbicide treatment to prevent expansion	Acre	\$225	50	\$11,250
Per Diem / Travel			1	\$1,382
Total Cost				\$15,897
GRAND TOTAL				\$26,192

Road Treatments:

The prescribed treatments for roads are designed to help preserve infrastructure while protecting the integrity of the National Forest system roads. Road treatments are designed to minimize damage caused by hazard trees, increased runoff and sediment transport across steep slopes, blowouts/roadway failures and erosion from drainage channels. Road treatments include: clean out culverts, ditches, lead outs, and re-grade roadway removing berms, and out-sloping where possible to handle increased flood flows and sediment transport caused by burn area. Installation of the prescribed road treatment will help to mitigate potential risk and further road damage. Storm response will include: keeping culvert and drainage structures functional by cleaning sediment and debris from the inlet between or during storm events. These costs are for contract labor and have overhead built in.

Road Treatment Costs:

ITEM	UNIT	UNIT COST	NO. OF UNITS	TOTAL COST
Install 24" CMP Culvert	Each	\$2,750	2	\$5,500
Install 48" End section	Each	\$2,100	1	\$2,100
Re-grade road, Clean out drainage ditches/culverts	Mile	\$2,500	16	\$40,000
Reinforce Rolling Dip	Each	\$300	10	\$3,000
Install New Rolling Dip	Each	\$400	10	\$4,000
Hazard Tree removal (protection of implementation team)	Mile	\$1,200	2.5	\$3,000
Slope Erosion Control at Culvert Inlet	Each	\$400	30	\$12,000
Storm Response (1 day/month, 4 months)	Day	\$2,500	4	\$10,000
TOTAL FOR ROAD TREATMENTS				\$79,600

Trail Treatments:

The prescribed treatments for trails and recreation sites are designed to help preserve life, safety and infrastructure. Trail treatments are designed to minimize damage to trails from increased runoff and sediment transport across steep slopes, and erosion from drainage channels in correlation with burn areas. Trail stabilization treatments include: construct hiker passable dips, outsloping, and ditching. Drainage channel stabilization treatments include: construct check structures with native rocks in the channel up and downstream of trail crossings.

Low water crossing treatments include: use local rocks and timbers to reinforce trail tread at drainage crossings. Installation of the prescribed trail treatment will mitigate potential risk and further trail damage.

Storm response will include: keeping erosion controls and rolling dips functional by removing sediment and debris build-up and repairing as necessary. Additional short-term stabilization treatments are proposed at the shooting range to prevent potential contaminants from migrating off site. Burned infrastructure associated with the Aspen Grove developed site is hazardous to public safety. Because of the potential for public to enter the area while under closure, it is critical that this material is removed. The risk assessment for trails and recreational sites showed a likely probability of damage with moderate consequences resulting in a high risk, with a very high risk for areas with life/safety threats. These costs are for contract labor and have overhead built in.

Trail Treatment Costs:

ITEM	UNIT	UNIT COST	NO. OF UNITS	TOTAL COST
Warning Signs	Each	\$150	8	\$1,200
Temporary Trail Closure	Each	\$350	1	\$350
Repair burned infrastructure (stairway)	Each	\$250	2	\$500
Trail Stabilization – 50% of miles	Mile	\$1,500	2.6	\$3,900
Hazard Trees removal (protect implementation team)	Mile	\$1,200	5.25	\$6,300
Slope Erosion Control – average 20-feet above trail	Acre	\$900	13	\$11,700
Drainage channel stabilization	Each	\$1,200	10	\$12,000
Armor trail at low water crossings	Each	\$600	10	\$6,000
Storm Response (1 day/month, 4 months)	Day	\$500	4	\$2,000
TOTAL FOR TRAIL TREATMENTS				\$43,950

Recreation Treatments:

Stabilization at shooting range to include: implement erosion and sediment controls to trap sediment and slow runoff flows to prevent transport to down gradient area. See Appendix A for treatment specifications.

Recreation Sites Treatment Costs:

ITEM	UNIT	UNIT COST	NO. OF UNITS	TOTAL COST
Warning Signs	Each	\$150	6	\$900
Removal of burned infrastructure	Lump sum	\$3,500	1	\$3,500
Hazard Trees removal (for implementation team protection)	Mile	\$1,200	1	\$1,200
Stabilization at shooting range	Lump sum	\$20,000	1	\$20,000
TOTAL FOR RECREATION SITE TREATMENTS				\$25,600

Protection/Safety Treatments:

Closure:

The prescribed treatments for emergency closure are designed to control access to preserve life and safety. Closure monitoring will be provided by District LEO and FPO personnel. The warning signs and gates are

temporary in nature and will be removed when the risk is mitigated and the closure is revoked. The fencing to prevent access to/from non-system roads and trails and uncontrolled off-road travel may be left in place until decommissioning of these trails and roads is completed by the District. These costs are for contract labor and have overhead built in. As of July 17, the Pike National Forest has issued 14 citations to people violating the closure order. LEO / FPO will be involved in the short term closure until closure structures are in place.

ITEM	UNIT	UNIT COST	NO. OF UNITS	TOTAL COST
Warning Signs	Each	\$200	60	\$12,000
Closure gates	Each	\$6,500	3	\$19,500
Temporary Closure Fencing	Mile	\$6,000	2	\$12,000
Closure Monitoring	Day	\$350	30	\$10,500
Per Diem/ Travel			1	\$7,944
Misc. Supplies			1	\$1300
TOTAL FOR CLOSURE TREATMENTS				\$52,444

Extended Emergency Coordination: This involves communication and coordination with other federal, state, and local agencies with jurisdiction over lands where life and property are at risk from post-fire conditions. The Waldo Canyon Fire will need follow-up activities due to the complexity of issues. Actions include but are not limited to cooperating with other agencies on hazard notification systems, permitting the siting of rain gages and soil moisture instruments to monitor conditions within the burn in support of National Weather Service forecasts, and exchanging information and coordinating the BAER implementation plan as needed when subsequent recovery plans are developed by other agencies. The initial cost request plans for this effort to include a primary coordinator assigned to the district to facilitate coordination and a technical specialist (i.e., geologist, hydrologist) to aid the coordination for the primary resource issues associated with this fire. Additional coordination needs may ensue costs for which will need to be requested on an interim 2500-8. Throughout the next 3-5 years it is critical that appropriate agencies maintain due diligence and continue to inform the public of the potential hazards resulting from post-fire watershed response. There is a high likelihood that access for emergency traffic along routes that provide for ingress and egress throughout and downstream of the burn area may become compromised.

Interagency Coordination Treatment Costs

Item	Unit	# of Units	Unit Cost	Total
GS-12 Forest Liaison	Days	30	\$400	\$12,000
Vehicle	Miles	\$0.45	750	\$3,375
Total				\$15,375

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.)

Land Treatments

Hillslope treatment effectiveness monitoring plan will be developed and submitted as an addendum to this request. This plan will be coordinated with the regional office as appropriate.

Road Treatments

Road engineer will monitor treatments weekly to evaluate effectiveness.

Item	Unit	# of Units	Unit Cost	Total
Road Treatment monitoring (4 days/month, 4 months)	Day	16	\$350	\$5,600
Total				\$5,600

Heritage Sites

For the Waldo Canyon Fire, cultural resource site treatments effectiveness monitoring shall take place after a significant precipitation event to determine if mulching objectives were met. It shall consist of surface inspection transects to determine if there is still adequate soil cover from mulch treatment and photo documentation.

Effectiveness monitoring needs to take place once a month, until the area has been naturally covered by snow or vegetation growth in order to determine if vandalism and looting protection measures are being met. See the attached Heritage Resource Treatment Implementation and Effectiveness Monitoring Plan for complete details of monitoring.

ITEM	UNIT	UNIT COST	NO. OF UNITS	TOTAL COST
1- GS7	Day	\$160	6	\$960
Mileage	Miles	0.34	720	\$252
Total for Monitoring				\$1,212

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim # 2

			NFS Lands	
		Unit	# of	
Line Items	Units	Cost	Units	BAER \$
A. Land Treatments				
Woodshred	1958	\$2,272.00		\$4,448,576
Ag Straw	1080	\$679.00		\$733,320
Noxious Weeds	1	\$26,192.00		\$26,192
<i>Insert new items above this line!</i>				\$0
<i>Subtotal Land Treatments</i>				<i>\$5,208,088</i>
B. Roads/Trails				
Roads- 16 miles	1	\$79,600.00		\$79,600
Trails - 8 miles	1	\$43,950.00		\$43,950
<i>Subtotal Roads Treatments</i>				<i>\$123,550</i>
D. Protection/Safety				
Signage/Closure	1	\$52,444.00		\$52,444
Recreation Sites	1	\$25,600.00		\$25,600
Extended Emergency Coordination	1	\$15,375.00		\$15,375
<i>Subtotal Protection/Safety</i>				<i>\$93,419</i>
E. BAER Evaluation				

Team Assessment	1	\$200,000.00		\$200,000
<i>Insert new items above this line!</i>				
<i>Subtotal Evaluation</i>				\$0
F. Monitoring				
Cultural Resource	1	\$1,212.00		\$1,212
Road Treatments	1	\$5,600.00		\$5,600
<i>Subtotal Monitoring</i>				\$6,812
G. Hill Slope and Channel Stabilization				
Woodshred (\$2200 per Acre)	1000	\$2,200.00		\$2,200,000
Ag Straw (\$1200 per Acre)	2198	\$1,200.00		\$2,637,600
Total	3198			\$4,837,600
Interim #1				\$344, 296
Interim #2				\$1,251,300
H. Totals				
Total				\$6,244,600

Total approved in Initial Request: \$5,087,573

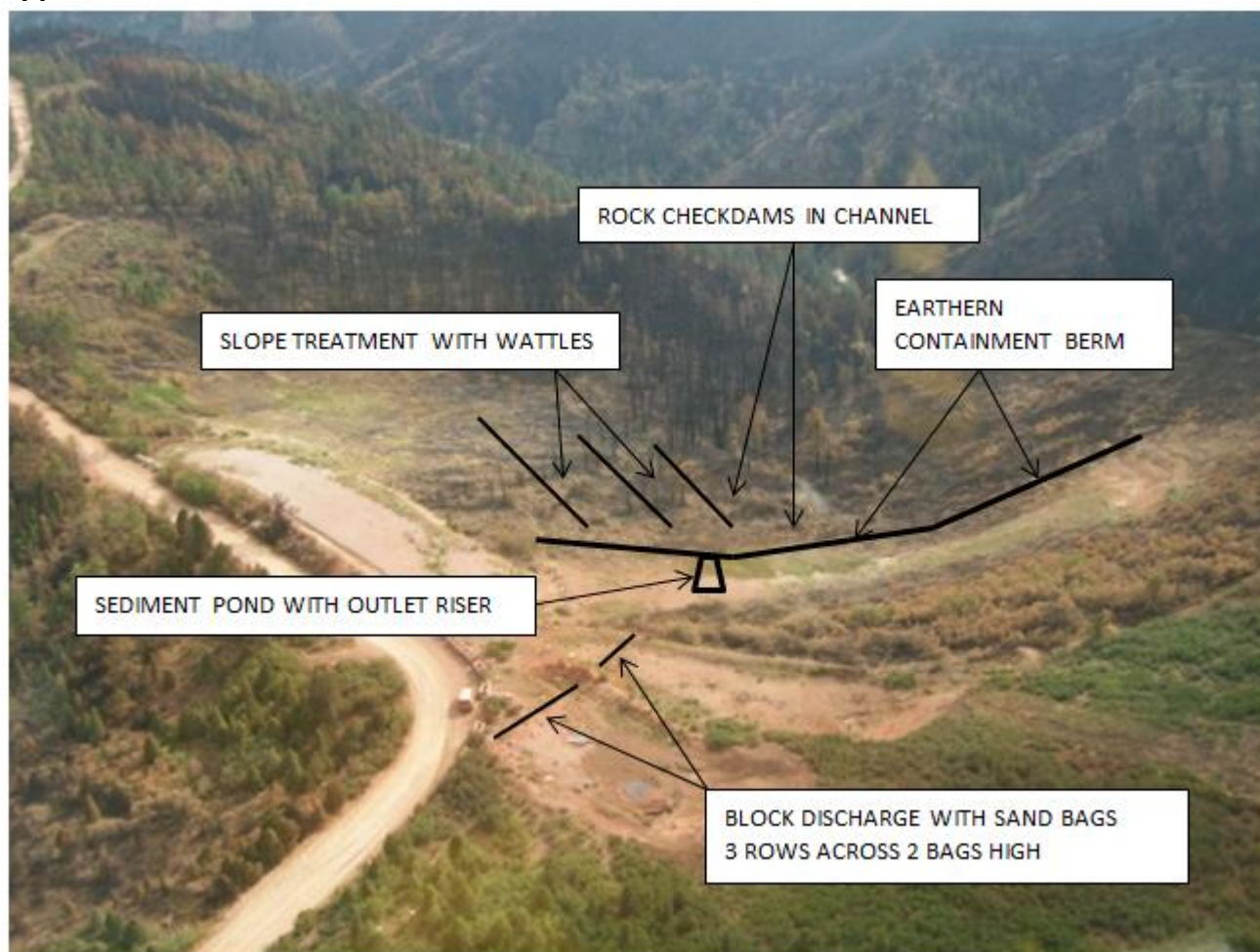
Total requested in Interim #1: \$344, 296

Total requested in Interim #2: \$1,249,000

PART VII - APPROVALS

1. /s/ Jerri Marr _____ 5/23/2013
Forest Supervisor (signature) Date
2. _____
Regional Forester (signature) Date

Appendix A:



RAMPART SHOOTING RANGE: HAZARDOUS MATERIALS STABILIZATION

DETAIL FOR SHOOTING RANGE COSTS:

ITEM	UNIT	UNIT COST	NO. OF UNITS	TOTAL COST
Mobilization	miles	\$10	480	\$4,800
Move Barricades at Road	hours	\$135	4	\$540
Straw wattle slope treatment	foot	\$6	800	\$4,800
Rock Checks in downgradient channels	each	\$350	4	\$1,400
Sediment Pond with outlet riser				
24" CMP	foot	\$65	30	\$1,950
outlet riser w/rock apron	each	\$1,000	1	\$1,000
Containment Berm below 100 yd range	hours	\$135	12	\$1,620
Sand Bags to block runoff at 25 and 50yd range	each	\$0.30	2500	\$750
Sand to fill bags	CY	\$28	65	\$1,820
Labor to fill and place bags	each	\$13.20	100	\$1,320
		TOTAL		\$20,000

Appendix B

Waldo Canyon Fire Proposed Hill Slope and Channel Stabilization Project Locations.

