

Date of Report: 9-16-2009

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 #1
☒ 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: **Mill Flat Fire** B. Fire Number: **UT-DIF-090383**
C. State: **Utah** D. County: **Washington**
E. Region: **04 - Intermountain** F. Forest: **07 - Dixie**
G. District: **01 - Pine Valley** H. Fire Incident Job Code: **P4E5GV (0407)**
I. Date Fire Started: **July 25, 2009** J. Date Fire Contained: **September 7, 2009**
K. Suppression Cost: **\$7,000,000 (est.)**

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): **20.9 miles total (15.6 dozer line and 5.3 hand line)**
2. Fireline seeded (miles): **15.3 miles planned on dozer line**
3. Other (identify):

M. Watershed Number(s): (6th level hydrologic units, percent of watershed acres within fire perimeter):

HU Number	HU Name	% in Fire	HU Number	HU Name	% in Fire
170402190805	Pinto Creek	54.4	170402191001	Grass Valley Creek	7.4
170402190901	North Ash Creek	38.1	170402191002	Ash Creek Reservoir – Ash Creek	0.1

N. Total Acres Burned: 12,607NFS Acres(**12,127**) BLM (**40**) Private (**440**)

O. Vegetation Types:

Vegetation Group	Acres
Curlleaf Mountain Mahogany	2,248
Mixed Conifer	4,027
Pinyon-Juniper	4,128
Mountain Brush	2,204

P. Dominant Soils: The soils are typically 10 to 40 inches deep to bedrock with very gravelly to very cobbly sandy loam and loam surface textures formed from quartz monzonite porphyry (Pine Valley laccolith).

Q. Geologic Types: The soils within the Mill Flat fire were formed quartz monzonite porphyry, a gray, coarse-grained, intrusive igneous rock similar to granite but with a slightly different mineral composition. The Pine Valley Mountains, which are capped by an igneous, mushroom-shaped intrusion called the Pine Valley laccolith was emplaced about 21 million years ago as molten rock from deep within the earth moved upward into shallow overlying sedimentary rocks. There it spread out and crystallized into what is one of the largest such intrusions in the world; uplift and erosion have since uncovered this granite-like rock.

R. Miles of Stream Channels by Order or Class: **Perennial: 9.7 miles** **Intermittent: 47.4 miles**

S. Transportation System: Trails: 15.4 miles Roads: 1.9 miles

PART III - WATERSHED CONDITION

Burn Severity on National Forest Lands (acres): **4,532** (unburned & low) **6,265** (moderate) **1,810** (high)

Burn severity for example microsheds with potential BAER concerns

Microsheds	Severity (acres and percent within Hydrologic Unit)			
	High	Moderate	Low/Unburned	Total
Pinto Creek	12 (0.1%)	259 (2.5%)	9886 (97.4%)	10157
Comanche Creek	159 (2.6%)	1717 (28.6%)	4133 (68.8%)	6009
Straight Canyon	398 (13.1%)	1399 (46.1%)	1236 (40.8%)	3033
Dam Canyon	882 (18.2%)	1650 (34%)	2314 (47.8%)	4846
Anderson Valley Trail	194 (26.4%)	443 (60.3%)	98 (13.3%)	735

B. Water-Repellent Soil (acres):1,358

C. Soil Erosion Hazard Rating (acres):
410 (low) **1,765** (moderate) **10,432** (high)

D. Erosion Potential: **7.1** average ton/acre (2.9 to 18.2 tons/acre first year erosion rate)

E. Sediment Potential: **36,920** cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): **5 to 10**

B. Design Chance of Success, (percent): 90% (wood straw mulch)
60-70% (ag straw mulch)

- C. Equivalent Design Recurrence Interval, (years): **2 and 5 year events**
- D. Design Storm Duration, (hours): **15 minute and 24 hour**
- E. Design Storm Magnitude, (inches):
- **15 minute 2 yr event - 0.47**
 - **15 minute 5 yr event - 0.64**
 - **24 hour 2 yr event – 1.89**
 - **24 hour 5 yr event – 2.35**
- F. Design Flow, (cubic feet / second/ square mile):
- 24 hour/5 year event**
Pinto Creek - 47
Comanche Creek - 26
Straight Canyon - 21
Dam Canyon - 27
Anderson Valley Trail - 9
- G. Estimated Reduction in Infiltration, (percent): **25%**
- H. Adjusted Design Flow, (cfs per square mile): **see table**

Microsheds (24 hour/5 year storm)	Design Flow (cfs per square mile)	
	Pre-fire	Post-fire
Pinto Creek	873	1501
Comanche Creek	242	431
Straight Canyon	102	412
Dam Canyon	212	468
Anderson Valley Trail	11	115

PART V - SUMMARY OF ANALYSIS

Background: On July 25, 2009 a lightning storm crossing the Pine Valley Wilderness ignited a fire near Mill Flat, approximately 7 air miles southwest of New Harmony, Utah.

The fire was 100% contained on Tuesday, September 7, 2009. The final acreage of the fire was 12,607 acres on the Dixie National Forest, and lands managed by the Bureau of Land Management and private land. The following day, a Color Country Type 3 Team, led by Incident Commander, Taiga Rohrer, took command of the incident as firefighters continued mop-up and suppression rehabilitation (removal and camouflage of handlines and bulldozer lines).

A. Describe Critical Values/Resources and Threats:

Summary of Issues:

Human Life and Safety

The Mill Flat fire caused high and moderate intensity burns in headwater streams and midslope areas that drain directly to New Harmony. These steep confined channels are likely to concentrate increased flows and debris flows into year round occupied homes threatening human safety. Many homes are built into alluvial debris fans where increased flows can migrate across the fan impacting multiple homes. A thunderstorm on early Saturday

morning September 5th activated a debris flow in the North Ash Creek area impacting farm fields and pastures with ash and fire debris. This highlighted the increased risk which many homes, private lands, farm fields and pastures below the fire now face.

Property

Forest Roads Page Ranch Road #30029 and Main Canyon Road #30931 and over 25 miles of trail occur within or below the burned area. Culverts, bridges and drainage structures sited along these routes are at risk of damage from floods, erosion, sediment, debris, and debris flows generated from within the burned area. Some homes and the road system near New Harmony may also be subject to flooding due to increased peak flows and debris flows that may block the channel. Flooding along this stream may result in road washouts trapping home owners. It may also inundate homes as the stream ponds around the obstruction. Several homes near North Ash Creek, Pinto Creek and Comanche Creek are built within a few feet of the channel increasing the risk of flooding.

Trails may capture increased surface runoff caused by the presence of water repellent soils and suffer severe erosion and mass failures impacting trails, water quality, and aquatic habitat downslope. Many trails within the fire perimeter parallel streams or cross mid-slope, increasing the risk of damage. In particular, Main Canyon drainages are areas of concern because of the large amount of terrain with high and moderate severity burns increasing the potential for floods and debris flows.

Critical Natural Resources

Water Quality – The threat of erosion has increased over much of the fire, trails and roads are likely to be impacted by higher hillslope runoff and debris flows, scouring trends and increasing sedimentation to streams. This increased sediment and ash will affect water quality in streams directly below the fire and in the North Ash Creek and further downstream into the Virgin River. There is domestic water sources in Comanche Creek (Comanche Spring) and the intake for New Harmony Irrigation Company (Main and Dam Canyon diversions) that could be impacted by degraded water quality. Comanche Creek, Straight Canyon, Dam Canyon, Main Canyon and North Ash Creek ran turbid for several hours after the September 5 storm depositing fine sediment along shallow depositional areas.

Fish Habitat - The threat of erosion has increased over much of the fire, impacted watersheds drain into the Virgin River via Ash Creek. They enter the Virgin River within critical habitat for the federally endangered roundtail chub (*Platypharodon argenteus*) and Virgin River chub (*Gila seminuda*). In addition to the two endangered species, desert sucker, and speckled dace, the Virgin River has two other native fish species, Virgin spinedace (*Lepidomeda mollispinis mollispinis*) and flannelmouth sucker (*Catostomus latipinnis*). Both these species are managed under interagency Conservation Agreements to alleviate the factors that would warrant listing them under the Endangered Species Act and are State of Utah Species of Concern. All six species can inhabit the lower portions of Ash Creek. Virgin spinedace, desert sucker, and speckled dace occupy Ash Creek up to Toquerville Springs. In late July and early August 2007 two large flood events, originating from recently burned areas in the Ash Creek drainage brought down large amounts of sediment and organic debris. During both these events, a dissolved oxygen concentration in the upper 15 miles of critical habitat for the two endangered species was reduced to less than 1 mg/l for nearly two hours. The poor water quality observed during these events resulted in a massive fish kill, which reduced fish populations by over 90%, and functionally extirpated roundtail chub in the wild. Aggressive stocking, translocation, and recovery efforts have begun to recover the fish population in this reach

Long-term Soil Productivity – In high and moderate soil burn severity areas the fire completely consumed the vegetation canopy and the effective ground cover that dissipates rainfall and regulates snowmelt runoff. Even with average precipitation, erosion rates will be accelerated in combination with higher surface runoff efficiencies. A 2- or 5-year rainstorm event occurring during the first two years following the fire will greatly

increase the potential for loss of topsoil, including the ash from the burned plant litter and duff that also replenish the soil nutrient pool, and reduce the soil productivity of these sites. The potential soil loss due to snowmelt and thunderstorm runoff jeopardizes the natural vegetation recovery.

Natural revegetation to establish vegetative ground cover to protect the soil surface in high and moderate soil burn severity areas will vary. The non-forest cover types (mostly south facing slopes) will likely be 5-10 years, while forested lands may take up to 10 or more years to establish pre-fire vegetative ground cover. Lack of vegetative cover and litter can contribute to chronic erosion and perpetual hillslope instability. Also of concern is native plant diversity due to the large populations of noxious weeds and cheatgrass adjacent to high severity burn areas.

Soil productivity can be severely impacted in the burned area due to the spread of noxious weeds from existing populations and the introduction of noxious weeds and invasive species into new areas as a result of fire suppression efforts and emergency stabilization treatments. In addition, recreational use of the roads and trails leaves the burned area highly susceptible to the expansion and introduction of noxious and invasive plant species.

B. Emergency Treatment Objectives:

The goal of the burned area emergency rehabilitation is to:

- Reduce threats to personal injury and/or human life of homeowners in the unincorporated areas and city of New Harmony by completing mulching and seeding in moderate and high severity burn areas.
- Reduce threats to personal injury and/or human life of homeowners in the New Harmony area by installing remote automated weather stations, warning signs, and storm patrols.
- Mulch and vegetation treatments are intended to mitigate soil loss. Elevated soil erosion, sedimentation, runoff, and stream flows are expected to occur at decreasing rates over two to five years after the fire, until vegetation has sufficiently recovered to restore the surface soil-hydrologic function and processes of the watersheds that burned at moderate and high severity. These treatments will allow grasses/shrubs to recover to a point where they will out compete invasive species such as cheatgrass and other noxious weeds. Vegetative recovery and early detection of invasive and noxious weed species (monitoring) are needed to determine if soil productivity objectives are being achieved.
- Control expected invasion of noxious weeds within the area, especially along and adjacent to Forest roads, dozer lines, helispots, spike camps and private land boundaries used by fire equipment and in existing populations within the Mill Flat fire boundary.
- Minimize damage to system roads and trails within the Mill Flat fire boundary by cleaning existing or installing new drainage structures.
- Warn users of Forest roads and trails of hazards present in the burned area.
- Identify appropriate monitoring activities that estimate the effectiveness of emergency stabilization treatments and identify necessary maintenance and continuation of other approved BAER activities.

Objective:

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

Land **60-90** % Channel **90** % Roads/Trails **75** % Protection/Safety **90** %

D. Probability of Treatment Success - Short duration high intensity storm events of greater than a 5 yr event can overwhelm most hillslope treatments.

	Years after Treatment		
	1	3	5
Land (noxious weeds)	75	80	80
Land (seeding)	60	70	75
Land (mulch)	75	80	80
Roads/Trails (drainage)	90	90	90
Protection/Safety (road/trail warning signs)	90	90	90
Protection/Safety (storm patrols)	90	90	90

E. Cost of No-Action (Including Loss): **\$20,130,000**

The values at risk directly lost through No-Action includes: damage to water quality, loss of soil productivity (as impacted by noxious weed potential and erosion), homes, recreational opportunities, roads, trails, utilities, and human life due to changed hydrologic and hillslope conditions.

Value At Risk	Estimated Cost
Damage to Water Quality	\$3,500,000
Loss of Long-term Soil Productivity and Ecosystem Integrity from an increase in invasive species and erosion.	\$7,000,000
Loss of Homes	\$7,500,000
Loss of Recreational Opportunities	\$550,000
Loss of Forest Roads	\$265,000
Loss of Trail System (Wilderness and Non-Wilderness)	\$690,000
Loss of Irrigation and Water System	\$445,000
OHV damage to watershed (rutting and vegetative trampling)	\$180,000
Total	\$20,130,000

F. Cost of Selected Alternative (Including Loss): **\$11,996,429**

Value At Risk	Estimated Cost
Damage to Water Quality, Loss of Homes, Loss of Recreational Opportunities and Loss of Irrigation and Water System. <ul style="list-style-type: none"> The mulching and seeding treatments are estimated to be 60% effective in reducing the frequency of runoff and slowing erosional processes for 1-2 year storm events. 40% failure rate of \$11,995,000 plus \$2,857,002 of the cost of the aerial mulching treatments. 	\$7,655,002
Loss of Long-term Soil Productivity and Ecosystem Integrity from an increase in invasive species and erosion. <ul style="list-style-type: none"> The mulching and seeding treatment is estimated to be 60% effective in reducing the frequency of cheatgrass invasion and slowing erosional processes. 40% failure rate of \$7,000,000 plus \$1,065,539 of the cost of the aerial seeding treatments. 	\$3,865,539
Loss of Forest Roads <ul style="list-style-type: none"> The road treatments are estimated to be 90% effective in protecting the forest roads. 10% failure rate of \$265,000 plus \$141,194 of the cost of the road treatments. 	\$167,694
Loss of Trail System <ul style="list-style-type: none"> The road treatments are estimated to be 80% effective in protecting the forest trails. 	\$279,194

<ul style="list-style-type: none"> 20% failure rate of \$690,000 plus \$178,160 of the cost of the trail treatments. 	
OHV damage to watershed (rutting and vegetative trampling) <ul style="list-style-type: none"> The barrier treatments are estimated to be 90% effective in protecting against resource damage. 10% failure rate of \$180,000 plus \$11,000 of the cost of the rock barrier treatments. 	\$29,000
Total	\$11,996,429

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input checked="" 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 type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS

Team Leader: **Rich Jaros, Forest Soil and Water Program Manager**

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Team Members:

Rich Jaros, Soil and Water Program Manager, Dixie National Forest
 Bill Goodman, Assistant Regional Hydrologist, Intermountain Region
 Chris Butler, Hydrologist, Dixie National Forest
 Kelsha Anderson, Hydrologist, Dixie National Forest
 Brian McInerney, Hydrologist, National Weather Service (NWS) Salt Lake City Office
 John Chatel, Fisheries Biologist, Sawtooth National Forest
 Mike Golden, Fisheries Biologist, Dixie National Forest
 Mark Madsen, Botanist, Dixie National Forest
 Steve O'Neil, Engineering, Dixie National Forest
 Jake Dodds, Engineering, Dixie National Forest
 Bill Wais, Forestry/Silviculture, Dixie National Forest
 Laurie Parry, Resource Information Manager (GIS), Dixie National Forest
 Matt Lee, GIS Technician, Dixie National Forest
 Randy Russell, Range Management Specialist, Pine Valley RD, Dixie National Forest
 Dan Misciagna, Backcountry Recreation Manager, Dixie National Forest
 Nick Glidden, Trails Program Manager, Dixie National Forest
 Nate Yorgason, Wildlife Biologist, Dixie National Forest
 Devin Johnson, Wildlife Biologist, Pine Valley Ranger District, Dixie National Forest
 Ron Rodriguez, Wildlife Program Manager, Dixie National Forest

H. Treatment Narrative:

Protection/Safety Treatments:

Road Hazard Signs

Purpose of Treatment: Ensure maximum visibility and readability of signs warning visitors of the hazards to human life and safety that exist in burned area. Signs are intended to emphasize the increased hazards from debris flows and flooding.

General Description: Install signs at key roads that enter or the burned area.

Location (Suitable) Sites:

- 1) One hazard sign on the FR 30931.
- 2) Two hazard signs on FR 30029.

Design/Construction Specifications:

- 1) Road Signs: Reflectorized wood backed signs (2' x 2') with letter size according to USFS Handbook specifications mounted on 4" x 4" x 8' posts at heights and distances mandated in USFS Handbook.

Trail Hazard Signs

Purpose of Treatment: Ensure maximum visibility and readability of signs warning visitors of the hazards to human life and safety that exist in burned area. Signs are intended to emphasize the increased hazards from falling burned trees, and potential for debris flows and flooding.

General Description: Install signs at all trailheads and junctions that enter or provide access to trails in the burned area. Install signs at all trailheads that enter or are within the burned area or provide access to trails within the burn.

Location (Suitable) Sites:

- 1) 8 signs in Mill Canyon Trailhead, Paradise Trailhead, Comanche Trailhead, Anderson Valley Trailhead, Syler Springs Trailhead, Upper Grants Ranch Trailhead, Grants Ranch Trailhead, and White Rocks Trailhead.

Design/Construction Specifications:

- 1) Trail Signs: Reflectorized wood backed signs 12"X18" trail signs, mounted on 4"x4"x8' posts at heights and distances mandated in USFS Handbook.

Remote Automated Weather Station

Purpose of Treatment: Several steep drainages above homes in Comanche, Straight, Dam, and Main Canyons burned at high intensity increasing the risk of flash floods and debris flows. A thunderstorm on September 5, 2009 caused a mud/debris flow into Ash Creek and streamside properties in New Harmony. This storm fortunately caused no significant damage, but it did highlight the risk of future post-fire events. A remote automated weather station (RAWS) will provide for better early detection and warning of intense precipitation events to the Iron County Sheriff's dispatch center. This information would then be sent to residence in the New Harmony. RAWS information would also be integrated into the National Weather Service (NWS) flash flood prediction forecasts. The NWS Salt Lake City office has been part of our BAER assessment and has been provided burn severity maps to track storms with radar to provide residence and the county with additional long range tracking.

General Description: RAWS stations will be provide by the National Fire Center (NIFC) in Boise. NIFC will install and maintain each RAWS station annually. They will also program trigger points for precipitation warnings. Requested funds would cover the installation and maintenance by NIFC for the first year. However, additional request for two more years will be needed until enough vegetative hillslope recover has occurred.

Location (Suitable) Sites: One RAWS stations would be installed to the west of New Harmony. Currently there are no weather stations to track storms in these locations. This station would be installed in "Sheep Pens" area to give an one hour notification time for flooding.

Design/Construction Specifications: Remote Automated Weather Station consists of a 6 ft tripod, meteorological sensors, and an aluminum environmental enclosure that houses and protects a CR1000M module and a 12 V battery. The battery is recharged via a solar panel or an AC transformer. Each RAWS-F station is pre-programmed to comply with the National Fire Danger Rating System (NFDRS) weather station standards. RAWS will measure wind speed and direction, air temperature and relative humidity, and precipitation. The RAWS-F includes a CR1000KD for on-site communications. Telecommunications options are our GOES satellite transmitter. The RAWS station is compatible with communication equipment such as telephones, digital cellular transceivers, and RF.

Comanche Springs Protection

Purpose of Treatment: To protect the culinary water supply from surface influences associated with the adjacent hiking trail and livestock.

General Description: Reinstall fencing associated with culinary spring source.

Location (Suitable) Sites: At and above Comanche Springs.

Design/Construction Specifications: Replace in kind with juniper and steel post fencing specifications.

Land Treatments:

Aerial Mulching (Agricultural and Wood Straw)

Purpose of Treatment: This treatment is to protect life and property located down-gradient of burned slopes by reducing the potential for erosion, sedimentation, and debris flow initiation. Mulching will reduce downstream peak flows by absorbing and slowly releasing overland runoff which is likely to be increased due to reduced soil cover and hydrophobic soil conditions. Mulching also helps to protect the seedbed and retains moisture on the burned slopes to facilitate quick vegetative recovery of the treatment areas. Mulching treatments in the headwaters of the streams would be anticipated to protect a much larger downstream area from cumulative runoff and sedimentation.

General Description: Wood strand erosional control mulch and agricultural straw mulch will be applied to the ground surface by helicopter (and spread with hand crews as necessary) in a continuous cover of uniform thickness to replace vegetative ground cover lost in the fire. Mulch will reduce erosion, sediment delivery, and reduction in the potential for debris flow initiation to downslope values at risk associated with: 1) life and property; 2) New Harmony, Washington County, and Dixie National Forest roads; 3) North Ash Creek and down stream to the Virgin River with important native fisheries. The mulch treatments are most effective in reducing runoff from 2 year or less storm events.

Wood strand erosional control mulch is preferred on (206 acres) above Comanche Springs. Field reviews with the BAER team indicated that wood mulch is the best treatment because the sites above New Harmony culinary water source are prone to wind erosion and have no surface vegetation that can breakup wind velocities or capture lighter wind blown agricultural mulch. Heavier wood straw can withstand higher wind speeds. Although the cost for wood straw is higher than agricultural straw, it will likely remain on site longer and provide for a more effective ground cover helping to minimize downslope hazards to the high value culinary water source at risk.

Agricultural erosional control mulch is preferred on (1,337 acres) above New Harmony. Field reviews with the BAER team indicated that agricultural straw is the best treatment because these sites above New Harmony are lacking effective ground cover to minimize downslope runoff hazards to the New Harmony and also to provide for critical moisture retention for vegetative recovery.

Location (Suitable) Sites: - Nine treatment units totaling 1,546 acres have been identified for treatment. The selected sites have been identified based on the post-fire increased streamflow and potential to initiate and translate debris flows down stream to critical values at risk. Three sites are face drainages located directly above the city of New Harmony. The other six sites are in upper basins of Comanche Creek and Straight Canyon. Refer to BAER Treatment Map for exact locations.

Design/Construction Specification(s):

Straw application rate - Agricultural strand erosional control mulch at a rate of 70% uniform cover of the surface area of any treatment unit. This is approximately 0.25 inches or 3 to 4 straw shafts deep but not to exceed 2 inches in depth. If aerial application does not achieve desired ground cover, hand crews will be necessary to distribute straw in each treatment unit. Use straw that conforms to Utah Department of Agriculture (UDAF) certified noxious weed free standards. Suitable sources include barley, rice and wheat straw which is required to be dry for application.

Wood strand application rate - Wood strand erosional control mulch at a rate of 50% uniform cover of the surface area of any treatment unit. This is approximately 0.5 inches to 0.75 inches, or 3 to 4 shafts deep. The length of wood mulch shall not be less than 2.5 inches, and not exceed 6.5 inches. The width shall be no more than 3/16 of an inch, with a thickness of no more than 1/10 inch. All wood mulch must

be air-dried prior to processing, and free of any additives to preserve product. If aerial application does not achieve desired ground cover, hand crews will be necessary to distribute straw in each treatment unit.

Seeding

Purpose of Treatment: To seed with grasses in high and moderate severity burn to minimize spread of adjacent cheatgrass and noxious weeds and to aid in preventing soil productivity loss, erosion, debris flows to private land and residences.

General Description: Aerially seed with grasses in conjunction with mulch treatments on 1,546 acres and on 6,748 acres of other areas to increase the likelihood of success for soil stabilization, establish vegetation in high and moderate severity burn and to prevent additional soil productivity loss. The seeding applications are most effective beyond the first growing season. Success of seeding treatments is dependent upon favorable soil and climatic conditions during germination periods.

Location (Suitable) Sites:

See attached maps.

Design/Construction Specifications:

See attached specification sheets.

Noxious Weeds

Purpose of Treatment: Reduce the potential for expansion of known noxious weed infestations in susceptible burned areas due to fire related disturbance and prevent increase in weed density in existing infestations. Field reviews by Forest Service BAER team specialists indicate that there is a substantial risk of noxious weed invasion. Over 2,500 acres of known infestations have been recorded within or adjacent to the Mill Flat Fire. These threats include a high likelihood that noxious weed seeds were brought into the area by fire suppression equipment that came to the Mill Flat Fire directly from another wildfire without proper equipment cleaning, suppression activity (including mechanical lines, hand lines, staging, helibases, spike camps) within known noxious weed occurrences, and a large variety for known noxious weed seed sources within the burn.

General Description: The district will treat approximately 2,833 acres of existing and susceptible noxious weed acres within and adjacent to the fire within forest boundaries. The district will also treat 11 acres that were directly impacted by suppression activities (helibase, incident camps, dozerlines, handlines, and drop points). Monitoring is proposed for the remainder of the acres affected by the fire. Any noxious weed infestations found as a result of the fire will be targeted for immediate eradication using appropriate application techniques and herbicides. All treatments will take place in accordance with the Forest Noxious Weed Management Plan. Treatment of new infestations will be based upon what is found during monitoring one year after the fire. Several trips may be needed to appropriately treat weeds given the variable life history characteristics of the known noxious weeds in the burned area. This allows for the immediate treatment and eradication of known infestations at the appropriate life stage and is most effective.

Location (Suitable) Sites: Known noxious weed populations (Spotted Knapweed, Scotch, Musk, and Star thistle) exist within and immediately adjacent to the burned area. Most populations to date occur on private lands and within the fuel break within the forest boundary. Noxious weeds also occur along the roads used by engines to access the fire, parking areas, the incident camp, and helibase. Some treatment locations are in remote locations and will require extra time to access each site.

Area Disturbed by Suppression Actions and the Burned Area:

1. Four spike camps
2. Eight helispots
3. Trailheads within and adjacent to the fire perimeter trailheads
4. Eighteen miles of dozer and handlines associated with suppression.
5. Two temporary repeater sites
6. Selected locations within the cattle grazing allotments. Locations to be determined and implemented by Range Staff.

7. Wildland Urban Interface

Design/Construction Specifications: Select herbicide, application rate, and application based upon specific weed being treated, and access to the location of the infestation.

Roads and Trails Treatments:

Road Drainage Maintenance

Purpose of Treatment: The purpose of these treatments is to increase culvert capacities, install water bars (rolling dips) and road side slope armoring (gabions) to accommodate increased water flows and associated bedload and debris, and restore road template drainage. The objectives for accommodating increased flows are to: 1) stabilize and protect the existing transportation facilities; 2) decrease the chances of washing road fill into adjacent streams; and 3) minimize road failure induced flooding that could impact human life and safety.

General Description: The emergency stabilization recommendations for Forest Roads 30931 and 30029. are as follows:

- 1) 240 feet of 24 inch culvert placement.
- 2) 214 square yards of gabions.
- 3) Harden 3 low water crossing.
- 4) 15 cross drains (rolling dips).
- 5) 1 closure gate.

Location (Suitable) Sites: Forest Roads 30931 and 30029.

Design/Construction Specifications:

- 1) Survey, design, and contract administration by USFS.
- 2) Forest Service Specifications for Construction of Roads and Special Contract Provisions.

Barrier Rock

Purpose of Treatment: To ensure boulders will remain in place for a sufficient time to allow for the regrowth of vegetation and to minimize hillslope erosion and spread of noxious weeds by ATV's and 4x4 vehicles.

General Description: Install barriers at trailheads in the New Harmony area and at trails originating from the Forest Roads U1275, U1274, 30931, 30932 and 30259 to prevent illegal off-road 4X4 vehicle and ATV use to protect watershed values and cultural sites in the area. Native rock that can be harvested on site or in the vicinity will be used. Barriers will be left in place to allow vegetation to continue to reoccupy the open burned areas.

Location (Suitable) Sites: At Anderson Valley and Comanche Trailheads and on 5 road access areas (approx. 7 sites total) in the Comanche Creek, Pinto Creek and Straight and Dam Canyon drainages.

Design/Construction Specifications: Boulders, approx. 140 cubic yards total, set 24" or .33% of the total volume below ground.

Trail Drainage Maintenance/Construction

Purpose of Treatment: The trail maintenance/construction is needed to provide for maximum effectiveness of water bars to efficiently route water and sediment from the trails, thereby preventing erosion of trail surface and minimizing impacts to water quality and additional sedimentation. Predicted increases in surface runoff/overland flow are expected to erode soils from the burned area and deliver sediment to adjacent streams. Trails within burn perimeter are excellent conveyors for routing significant volumes of sediment to nearby streams if drainage facilities are not adequate to process increased runoff. In addition, the increased flows can erode trail tread, delivering even greater amounts of sediment to nearby streams.

General Description: Trail maintenance/construction on Anderson Valley, Comanche, Summit and Mill Canyon trails near high and moderate severity burned areas to ensure increased runoff will not destroy trail tread and contribute sediment to streams impacting water quality and additional sedimentation.

Location (Suitable) Sites: Trails within burn perimeter are likely to contribute significant volumes of sediment to stream system if drainage facilities are not adequate to increased runoff. Within the fire perimeter, 13.2 miles of trail are in areas of high or moderate severity burns.

- 2.93 miles the Comanche Trail (31011).
- 4.81 miles the Anderson Valley Trail (31022).
- 1.35 miles the Mill Canyon Trail (31013).
- 4.07 miles the Summit Trail (31021).

Design/Construction Specifications:

1. Construct Check Dams according to EM-7720-104 (drawing 915-2).
2. Construct Grade Dip according to EM-7720-104 (drawing 912-4).
3. Construct Waterbars according to EM-7720-104 (drawing 922-1 and 922-2).

I. Monitoring Narrative:

Vegetation recovery monitoring will integrate assessing the effectiveness of the emergency hillslope and channel stability treatments. The integrated monitoring will include methods and parameters that evaluate: seeding, mulch cover, noxious weeds and invasive species. A key element of the integrated monitoring is to evaluate if ground cover objectives are being met. Achieving the ground cover objectives should mitigate most, if not all of the short term hazards and concerns associated with the loss of vegetative cover in the burned area. The benefits of early (or rapid) revegetation and ground cover will: 1) reduce the impacts of “normal” and 2-year precipitation events on erosion and surface runoff/overland flow; 2) decrease the flood hazard and debris flow potential; 3) minimize the spread of existing noxious weed and invasive plant species; and 4) decrease the possibility of new infestations of undesirable plant species in the burned area. Overall, the combined treatments of seeding and mulching are intended to address the hazards that put lives and property at risk, through the related advantage of maintaining soil productivity by keeping soil on site and establishing desirable vegetation for short and long term ecosystem sustainability.

A monitoring plan will incorporate metrics that address the objectives for each of the emergency hillslope and channel treatments as well as identification of noxious weeds and invasive plants. The intent is to collect the essential information and avoid multiple visits to the treatment locations. While the underlying assumption for the integrated monitoring is the emergency stabilization treatments were correctly installed in the appropriate locations, maintenance needed to ensure the treatments continue to operate and function properly will also be documented.

All monitoring reporting cost were calculated at a GS-11 day rate of \$350 per day.

Noxious Weed Monitoring

The purposes of the monitoring are to prevent known noxious weed infestations from spreading and/or increasing in density, to detect and rapidly respond to new infestations associated with fire suppression/fire effects of the Mill Flat Fire and to prevent potential new infestations resulting from BAER emergency response action.

Monitoring will be at an intensity and frequency to identify the spread or occurrence of weed infestations following the fire event and recovery. Monitoring will be conducted for the next three growing seasons (starting 2010) under BAER authorization. Monitoring needs following this period will be conducted under normal program authorities. A minimum of five years of monitoring should be implemented in combination between BAER and other program authorities. The following areas will be monitored for establishment or spread of noxious weed, if noxious weed infestations are identified an appropriate

treatment will be implemented to eradicate or control the infestation (i.e. hand pulling, herbicide application, biological agent control, seeding of native species). Monitoring within the burned area will focus on areas with existing noxious weed infestations and adjacent areas.

1) Area Disturbed by Suppression Actions and the Burned Area:

- Four spike camps
- Eight helispots
- Trailheads within and adjacent to the fire perimeter trailheads
- Eighteen miles of dozer and handlines associated with suppression.
- Two temporary repeater sites
- Selected locations within the cattle grazing allotments. Locations to be determined and implemented by Range Staff.
- Wildland Urban Interface

2) Monitoring areas disturbed by BAER and other recovery actions.

- Wood/Straw mulch treatment areas and straw storage/staging areas will be monitored for noxious weed establishment.
- Road and culvert emergency response actions will be monitored following their implementation for noxious weed introduction and/or spread. For roads and culverts, 2 sites have been identified for emergency response actions.
- Recreation treatments including water bars, trail reconstruction, and other necessary trail activities associated with BAER. Emergency response activities for trails and recreational facilities will include four trail segments.
- Wash station site associated with suppression activities will be monitored for 3 years following emergency response activities.

Aerial Seeding

Determine the percentage of seed establishment in areas seeded and compare with un-seeded areas. Monitor for noxious weed establishment and cheatgrass invasion. Determine if additional seeding/treatment are necessary. The use of transects and fixed plots will be used to sample vegetation.

Comanche Creek Culinary Water Pipeline Storm Patrols

The purpose of the monitoring is to evaluate effectiveness of the emergency stabilization treatments completed on the Comanche Spring culinary pipeline which includes several stream crossings where the pipeline can be exposed and subject to flood damage and breakage and to identify additional work needed to maintain and/or repair treatments. Engineering and hydrology personnel will survey the pipeline following storm events.

Aerial Mulching

The purpose of this monitoring is to determine if ground cover objectives for mitigating raindrop impact erosion and accelerated surface runoff are being met. The primary indicator is ground cover resulting from aerial application and condition of wood strand or agricultural straw mulch. At least 15 transects would be completed within each of the four treatment areas using a pace-step or point intersect methodology.

Trail Drainage Monitoring

The purpose of the monitoring is to identify maintenance and/or repairs necessary for ensuring effectiveness of the trail drainage maintenance and water bar construction in meeting objectives of minimizing damage to the trail resource and reducing sediment delivery to adjacent streams. Trail/recreation personnel will survey the trails located within the high or moderate burn severity areas, and specific trail segments where new water bars were constructed after Spring snow-melt. Monitoring will evaluate trail tread erosion and efficiency of water bars to route surface flows from trails into areas where sediment is not delivered to nearby streams.

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim#1 Request

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands			All Total \$
			# of Units	BAER \$		# of units	Fed \$	# of Units Non Fed \$	
A. Land Treatments									
Noxious Weed Treatment	Acres	23	2844	\$64,380	\$0		\$0	\$0	\$64,380
Aerial Seed/Aq Straw Area A	Acres	1593	215	\$342,436	\$0		\$0	\$0	\$342,436
Aerial Seed/Aq Straw Area B	Acres	1570	293	\$460,138	\$0		\$0	\$0	\$460,138
Aerial Mulch Wood Straw	Acres	4102	206	\$844,920	\$0		\$0	\$0	\$844,920
Aerial Mulch Aq. Straw	Acres	1459	829	\$1,209,508	\$0		\$0	\$0	\$1,209,508
Aerial Seeding Non Wilderness	Acres	145	3938	\$571,010			\$0	\$0	\$571,010
Aerial Seeding Wilderness	Acres	145	4,956	\$0	\$700,000		\$0	\$0	\$700,000
Subtotal Land Treatments				\$3,492,392	\$700,000		\$0	\$0	\$4,192,392
B. Channel Treatments									
Insert new items above this line!				\$0	\$0		\$0	\$0	\$0
Subtotal Channel Treat.				\$0	\$0		\$0	\$0	\$0
C. Road and Trails									
FR 30029 Drainage/Erosion	Miles	85851	1.34	\$115,041	\$0		\$0	\$0	\$115,041
FR 30931 Drainage/Erosion	Miles	30410	0.86	\$26,153	\$0		\$0	\$0	\$26,153
Barrier Rock	Each Site	1571	7	\$11,000	\$0		\$0	\$0	\$11,000
Anderson Valley Trail	Miles	13260	4.81	\$63,780	\$0		\$0	\$0	\$63,780
Comanche Trail	Miles	14235	2.93	\$41,710	\$0		\$0	\$0	\$41,710
Mill Canyon Trail	Miles	22926	1.35	\$30,950	\$0		\$0	\$0	\$30,950
Summit Trail	Miles	10435	4.07	\$42,470	\$0		\$0	\$0	\$42,470
Insert new items above this line!				\$0	\$0		\$0	\$0	\$0
Subtotal Road & Trails				\$331,104	\$0		\$0	\$0	\$331,104
D. Protection/Safety									
Road Hazard Signs	Each	3	732	\$2,196	\$0		\$0	\$0	\$2,196
Trail Hazard Signs	Each	8	395	\$3,156	\$0		\$0	\$0	\$3,156
Comanche Sprgs Protection	Each Site	16343	1	\$16,343	\$0		\$0	\$0	\$16,343
RAWS	Each	3000	1	\$3,000	\$0		\$0	\$0	\$3,000
Insert new items above this line!				\$0	\$0		\$0	\$0	\$0
Subtotal Structures				\$24,695	\$0		\$0	\$0	\$24,695
E. BAER Evaluation									
Assessment Team	Report	38000	1	---	\$38,000		\$0	\$0	\$38,000
Subtotal Evaluation				---	\$38,000		\$0	\$0	\$38,000
F. Monitoring									
Noxious Weeds	Report	3500	1	\$0	\$0		\$0	\$0	\$0
Aerial Wood/Straw Mulch	Report	3500	1	\$0	\$0		\$0	\$0	\$0
Trail Drainage	Report	3500	1	\$0	\$0		\$0	\$0	\$0
Road Drainage	Report	700	1	\$0	\$0		\$0	\$0	\$0
Aerial Seeding	Report	3500	1	\$0	\$0		\$0	\$0	\$0
Storm Patrols	Report	7183	1	\$7,183	\$0		\$0	\$0	\$7,183
Subtotal Monitoring				\$7,183	\$0		\$0	\$0	\$7,183
G. Totals				\$3,855,374	\$738,000		\$0	\$0	\$4,593,374
Previously approved				\$427,361					
Total for this request				\$3,428,013					

PART VII - APPROVALS

1. /s/ Gretchen Merrill (Acting for) 09/16/2009
Forest Supervisor (signature) Date

2. /s/ _____
Regional Forester (signature) _____ Date _____