Date of Report: 7-23-12

**BURNED-AREA REPORT**
(Reference FSH 2509.13)

## PART I - TYPE OF REQUEST

A. Type of Report

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

B. Type of Action

[**X**] 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: **Seeley Fire**

B. Fire Number: **UT-MLF-002129**

C. State: **Utah**

D. County: **Emery/Carbon**

E. Region: **04 - Intermountain**

F. Forest: **14 – Manti LaSal**

G. District: **Ferron and Price**

H. Fire Incident Job Code: **P4GZN4 (0410)**

I. Date Fire Started: **June 26, 2012**

J. Date Fire Contained: **July 18, 2012**

K. Suppression Cost: **$8,500,000 (est.)**

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): **21 miles total**
2. Fireline seeded (miles): **84 miles total**
3. Other (identify):

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

| $6^{th}$ level HUC | 6th level HUC Acres | % of 6th level HUC burned |
|---|---|---|
| Clawson Spring-Miller Creek | 14,886 | 29.71% |
| Left Fork of Huntington Creek | 30,562 | 11.28% |
| Miller Fork Canyon-Huntington Creek | 36,814 | 10.05% |
| Mud Creek | 36,626 | 3.09% |

| | | |
|---|---|---|
| Mud Water Canyon | 18,083 | 58.14% |
| Pinnacle Wash | 11,602 | 3.34% |
| Right Fork of Huntington Creek | 40,132 | 46.32% |
| Serviceberry Creek | 14,849 | 5.32% |
| South Fork of Gordon Creek | 15,598 | 30.88% |

N. Total Acres Burned: **48,050**
NFS Acres(**38,477**) Other Federal (**2,210**) State (**1,397**) Private (**5,966**)

O. **Vegetation Types**: Vegetation in this geographic area ranges from sagebrush/forb/grass, mountain brush, and aspen to spruce-fir, white fir, and small amounts of limber, white bark, and bristlecone pine.

Contour furrows and trenches installed from 1960-70 for watershed and range improvement are still visible. Many of the non-forested areas were sown with crested wheat and smooth brome in the 1960's and 70's. Prior to the fire, these introduced species still persisted within the contour furrows and they generally had not spread beyond seeded areas. Native species (e.g., needle and thread grass, slender wheat, june grass, salina wild rye) were recolonizing these previously seeded areas. Pinyon-juniper control activities (chaining) of the same era are being revisited to reduce tree density, increase ground cover, improve browse for wildlife, retard conifer encroachment, reduce fuel loads, and encourage diversity in the plant communities.

Prior to the fire understory tall forb communities in aspen appeared to be increasing. Pure tall forb communities were/are present but limited. Tarweed was/is present on open dry south slopes; however, native grasses are persistent. Mountain brush communities were/are stable. Overall range condition was stable to increasing prior to the fire.

P. **Dominant Soils:** The dominant soils are derived primarily from the Blackhawk Formation, Price River Formation and North Horn Formation. Incised interior canyons and low elevation soils on the northern, eastern and southern fringes are primarily derived from Mancos Shale, Star Point Sandstone, and Castle Gate Sandstone. The majority of the soils that formed from these geologic groups have, fine-grained loamy textures. Soils on north facing slopes are mostly skeletal with high quantities of larger rock (greater than ¾ inches) on the surface and through the soil profile. Soils on south facing slopes have similar amounts of rock which are more gravel-sized. Soils derived from the Mancos Shale geologic group have higher clay contents and clay textures, with high salt contents that cause the soils to easily disperse resulting in extremely erosive characteristics. Soils that developed from the Sandstone groups have sandy loam textures with higher rock contents. These deep coarser textured soils have higher permeability with lower erodible features, except on steep side slopes.

Q. **Geologic Types:**
- ***Mancos Shale*** consists of very fine grained to fine grained sandstone, siltstone and claystone that was deposited in offshore and open marine environment.
- ***Star Point Sandstone*** spans a 350-ft interval at Price Canyon and becomes finer grained eastward where it eventually grades into the Mancos Shale in the vicinity of the Price and Soldier Canyon areas (HettingerR.D., Kirschbaum M.A., 2002). The Star Point Sandstone is associated with littoral marine and marine deposits.
- ***Blackhawk Formation*** is considered one of the most important coal-bearing units in the Unita Basin. Young (1955) and Balsley (1980) identified several members which contains very fine grained to medium-grained sandstone, mudrock, carbonaceous shale, and coal.
- ***Castlegate Sandstone*** contains sheet-like sandstones that extend across large areas (HettingerR.D., Kirschbaum M.A., 2002). It is divided into a lower and upper unit at Price Canyon. The lower unit is predominately fine to medium-grained massive sandstone; deposited in a braided fluvial environment. The upper unit primarily consists of interbedded fine-grained sandstone and mudrock.

- ***Price River Formation*** consists primarily of poorly sorted, fine to medium-grained sandstone and siltstone deposited in meandering fluvial systems (Lawton, 1983, 1986).
- ***North Horn Formation*** can be found throughout Utah in the Unita Basin, Wasatch uplift and Paradox Basin. Dominant lithologies include coal, mudstone, claystone, siltstone and sandstone

R. Miles of Stream Channels by Order or Class: **Perennial: 38.8 miles Intermittent: 83.7 miles**

S. Transportation System: **Trails: 39.8 miles Roads: 43.04 miles**

## PART III - WATERSHED CONDITION

Burn Severity on National Forest Lands (acres): **9,709** (low) **14,519** (moderate) **7,433** (high)

Burn severity for example microsheds with potential BAER concerns

| Microsheds | Acres | High | Moderate | Low | Unburned |
|---|---|---|---|---|---|
| Corral Canyon | 574.21 | 117.21 | 203.01 | 176.88 | 77.11 |
| Engineer Canyon | 814.85 | 74.63 | 447.76 | 231.56 | 60.90 |
| Middle Fork Miller Creek | 1,362.20 | 124.28 | 558.19 | 385.06 | 92.07 |
| Nuck Woodward | 6,766.94 | 1,449.99 | 2,817.11 | 1,429.08 | 1,064.02 |
| South Hughes Canyon | 997.14 | 395.98 | 250.26 | 165.89 | 185.02 |
| Upper Mud Creek | 2,292.77 | 118.20 | 520.54 | 129.19 | 183.12 |
| Pole Canyon | 970.37 | 280.16 | 427.14 | 219.87 | 43.20 |

B. Water-Repellent Soil (acres): **21,952**

C. Soil Erosion Hazard Rating (acres):
**1,078** (low) **3,343** (moderate) **32,736** (high)

D. Erosion Potential: **6.4** ton/acre

E. Sediment Potential: **3,584** cubic yards / square mile

## PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): **2 to 5**

B. Design Chance of Success, (percent): **50%**

C. Equivalent Design Recurrence Interval, (years): **2 and 10**

D. Design Storm Duration, (hours): **10 minutes** **0.16 Hour**

E. Design Storm Magnitude, (inches):

- **2 yr event - 0.28**
- **10 yr event - 0.47**

F. Design Flow, (cubic feet / second/ square mile): **see table**

G. Estimated Reduction in Infiltration, (percent): **46%**

H. Adjusted Design Flow, (cfs per square mile): **see table**

| Engineer Canyon | |
|---|---|
| 2 Year 10 Minute storm 0.28 inches | |
| **Pre fire** | **Post fire** |
| 0 cfs (no flow from storm to channel) | 18 cfs delivered to channel |
| | 0.4 acre feet (volume of flow) |
| 10 year 10 minute storm 0.47 inches | |
| Pre fire | Post fire |
| 0 cfs (no flow from storm to channel) | 44 cfs delivered to channel |
| | 1 acre feet (volume of flow) |

| South Hughes | |
|---|---|
| 2 Year 10 Minute storm 0.28 inches | |
| **Pre fire** | **Post fire** |
| 0 cfs (no flow from storm to channel) | 38 cfs delivered to channel |
| | 2 acre feet (volume of flow) |
| 10 year 10 minute storm 0.47 inches | |
| Pre fire | Post fire |
| 0 cfs (no flow from storm to channel) | 95 cfs delivered to channel |
| | 5 acre feet (volume of flow) |

| Nuck Woodward Canyon | |
|---|---|
| 2 Year 10 Minute storm 0.28 inches | |
| **Pre fire** | **Post fire** |
| 0 cfs (no flow from storm to channel) | 143 cfs delivered to channel |
| | 8.2 acre feet (volume of flow) |
| 10 year 10 minute storm 0.47 inches | |
| Pre fire | Post fire |
| 0 cfs (no flow from storm to channel) | 375 cfs delivered to channel |
| | 21 acre feet (volume of flow) |

| **Nuck Woodward Canyon** | 2 year 10 minute event (0.28 inches) |
|---|---|
| **Post fire no mulch** | **Post fire with mulch** |
| 143 cfs | 111 cfs |
| 8.2 acre feet | 6.3 acre feet |

| **Engineer Canyon** | 2 year 10 minute event (0.28 inches) |
|---|---|
| **Post fire no mulch** | **Post fire with mulch** |
| 18 cfs | 4.6 cfs |
| 0.4 acre feet | 0.1 acre feet |

Thunderstorm driven – will influence overland flow/debris flows

## PART V - SUMMARY OF ANALYSIS

**Background:** The Seeley Fire began on the Manti-LaSal National Forest with a lightning strike on June 26 and was reported at about 6 a.m. The fire gained intensity as it entered areas containing large components of decadent standing beetle-killed timber, dead and down fuels. Area residents and visitors saw large columns of smoke for several days. The Forest ordered a Type 2 Incident Management Team to manage the fire.

The Eastern Arizona Incident Management Team, John Philbin, Incident Commander, assumed command of the incident on June 28. At the height of the incident, there were 517 people committed, including firefighting crews, engines, bulldozers, overhead (support personnel), etc. The fire was 100% contained on Wednesday, July

18, 2012. The final acreage of the fire was 48,050 acres on the Manti-LaSal National Forest, and lands managed by the Bureau of Land Management, the Utah Department of Lands, and private property.

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

**Summary of Issues:**

**Human Life and Safety**

**National Forest Administered Lands** - The Seeley fire caused high and moderate severity burns in headwater streams that drain directly to State Highway 31, designated campgrounds, Forest Service roads and trails in Huntington Creek drainage, dispersed campgrounds, and Forest Service roads and trails in the East facing drainages (First Water, Second Water, and Bob Wright). Many of the trails and roads within the fire perimeter are heavily used by the public. The Huntington and Eccles Canyons National Scenic Byway departs from Huntington City on State Highway 31 and winds north through Huntington Canyon. The National Scenic Byway is an important route for recreational, commercial, and private traffic. Steep confined channels have already deposited debris and sediment from several intense rain events (0.28"/hour on July 7th and 16th) onto many of these roads and trails. These flows highlight the increased risk which many sites within and below the fire now face. Further thunderstorms and spring snow melt have a high probability of continuing to concentrate flows and debris into these areas threatening human life and safety. Several campsites and roads have also been built across and on alluvial debris fans where increased debris has already deposited.

The risk of snow avalanches has also increased in Huntington canyon. Trees that helped to hold and stabilize snow on steep slopes are now weakened above State Highway 31. Over time, these dead trees will become structurally compromised and the steep, open slopes above this well-traveled road will become more avalanche prone.

**Possible Probability of Damage or Loss/Major Consequences – Risk Very High**

**Adjacent Private, State, and other Federal Lands** – Many roads downslope from East facing drainages (Miller, First Water, Second Water, and Bob Wright) have steep confined canyons that lead onto the Forest and provide access to historic coal mines and load out facilities, natural gas wells, and gas lines. Recent flash floods have carried debris and ash from steep burned hillslopes and has deposited material on road crossings and stream banks many miles beyond the town of Price Utah. Many users of these areas are likely unaware of heavy rains in headwater drainage and the downstream flood flows that follow rain events placing them at extreme risk.

**Property**

**National Forest Administered Lands** - The Seeley fire caused high and moderate intensity burns in headwater streams that drain directly to State Highway 31, designated campgrounds, Forest Service roads and trails, and campground water systems in Huntington Creek drainage, and, Forest Service roads and trails in the East facing drainages (Miller, First Water, Second Water, and Bob Wright). These steep confined channels have already deposited debris and sediment from several intense rain events (0.28"/hour on July 7th and 16th) onto many of these sites. Recent debris flows highlight the increased risk which many of these property sites within and below the fire now face. Future thunderstorms have a high probability of continuing to concentrate flows and debris outing these properties in very high risk to damage or loss. Several campsites and roads (South Hughes, Nuck Woodward, and First Water Canyons) have also been built across and on alluvial debris fans where increased debris has already deposited. Some of these campsites have been buried with debris flow sediment making them unusable for the foreseeable future.

Trails may capture increased surface runoff caused by the presence of water repellent soils and damage or loss to the trails is likely due to severe erosion and mass failures. In addition, the additional runoff on the trails can impact, water quality, and the State Highway 31 downslope. Many trails within the fire perimeter parallel streams increasing the risk of damage. In particular, Pole Canyon, Second Water Canyon, Nuck Woodward, N.F. Corner Canyon, Bob Wright Canyon and Left Fork Huntington 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.

**Possible Probability of Damage or Loss/Major Consequences – Risk Very High**

**Adjacent Private, State, and other Federal Lands** – Recent debris and mud flows from July 7th and 16th have shown just how far material can travel following a rain event. Ash and sediment have impacted water quality as far as the Mounds Road crossing on the Price River approximately 50 miles downstream of the fire. Within this area there are many property values at risk from reduced water quality. Those values that are closer to the fire would be at further risk from larger debris (logs and boulders). Aerial reconnaissance found a number of non FS roads and mining sites with ash and rock deposited around and on top of them. Specifically, powerlines, roads, inactive coal load out and coal mines in Middle Fork Miller Creek were severely damaged by debris flow events. These and other property (roads) on private and state lands from East facing drainages (First Water, Second Water, and Bob Wright) and Upper Mud Creek (Clear Creek drainage) will continue to be at risk from future events given the steepness of hillslopes and narrow box canyons.

The hydrologic behavior of the Huntington Creek watershed is experiencing noticeable changes since the Seeley Fire. Irrigation systems and a coal fire plant have been impacted and remain at risk. The Huntington/Cleveland Irrigation Company headgate has been buried with sediment and ash/sediment has clogged sprinkler lines. Increased sediment, ash, and debris sediment is creating both operational and financial impacts to the PacifiCorp – Huntington Power Plant. The Huntington Power Plant is a 900 megawatt power plant located near the mouth of Huntington Canyon. Huntington Plant uses approximately 11,000 acre-feet of water per year, which equates to an average diversion rate of 7,000 gallons per minute. Water to operate the plant comes exclusively from the Huntington Creek.

The Huntington Plant's water supplies are diverted from the Huntington Creek about one mile upstream from the plant. The plant owns, operates and maintains a diversion structure, equipped with traveling water screens and a gravity-fed pipeline that discharges water into a raw water settling basin located adjacent to the plant. Water is temporarily held in the settling basin, water is made available for various plant uses. The raw water settling basin has the holding capacity to provide enough water to run the plant for approximately four to five days.

PacifiCorp's Huntington Plant is already experiencing post-fire impacts associated with the high sediment and debris loading in Huntington Creek caused by precipitation events within the burned areas of Huntington Canyon. So far the two debris flows have caused the plant to shut their water intake for several days until the turbid flows have passed. It has also resulted in contamination of material in their settling pond and increased maintenance/removal of debris in external/internal screens costing $3,000/day. So far there has been no impact to the electrical generation, but larger events could shut the plant down for several days costing approximately $1.1 million per day in plant operation and replacement power.

**Critical Natural Resources**

**National Forest Administered Lands**

**Water Quality –** The threat of erosion has increased over much of the fire as a result of the high intensity burns that removed surface vegetation and increased rill erosion, scoured channels from the debris flows, and hillslopes hit by thunderstorms on July 7th and 16th. Water quality is likely to be impacted by greater post fire

hillslope runoff and debris flows, scouring treads and increasing sedimentation to streams. Hillslopes are also likely to continue to contribute sediment and increased runoff until enough ground cover establishes on burned slopes. Ash and sediment originating from the fire has impacted water quality as far as the Mounds Road crossing on the Price River approximately 50 miles downstream of the fire. Within this area there are many water systems for domestic and agriculture are at risk from reduced water quality.

**Possible Probability of Damage or Loss/Major Consequences – Risk Very High**

**Native or Naturalized Plant Communities-**Field reviews indicate that there is a substantial risk of noxious weed invasion along roads, trails, handlines and dozerlines used during fire suppression activities. This threat is due to the liklihood that some noxious weed seeds were brought into the area by fire equipment that has been used on other wildfires and suppression activity within known noxious weed locations within the burn. Known noxious weed populations (Musk Thistle, Scotch Thistle, Hoary Cress, Hounds Tongue exist within and immediately adjacent to the burned area. Most populations to date occur along existing road systems, decommissioned roadways, and trails. Musk Thistle and Hounds Tongue were scattered along the roadways used by engines to access the fire. Musk Thistle is located around springs, ponds, and within riparian areas that burned. There is also invasive cheatgrass scattered in small amounts along the east side of the fire in lower elevations within and adjacent to the fire.

The burned area, now lacking desired vegetation that would normally compete with noxious weeds, is vulnerable to expansion of existing noxious weed sources and other invasive species (Cheatgrass). Even in the low intensity burned areas, it will still take at least one growing season (Summer 2013) until native vegetation can reestablish and compete with existing unburned noxious weed populations.

**Possible Probability of Damage or Loss/Major Consequences – Risk High**

**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 2-3 years, while forested lands may take up to 5-7 years to establish pre-fire vegetative ground cover. Lack of vegetative cover and litter can contribute to chronic erosion and perpetual hillslope instability.

**Possible Probability of Damage or Loss/Major Consequences – Risk Very High**

**Adjacent Private, State, and other Federal Lands**

**Fish Habitat** - The threat of erosion has increased over much of the fire as a result of the high intensities, scoured channels from the debris flows, and hillslopes hit by the thunderstorm on July 7th and 16th. Trails and roads are likely to be impacted by higher hillslope runoff and debris flows, scouring treads and increasing sedimentation to streams. Hillslopes are also likely to continue to contribute sediment and increased runoff until enough ground cover establishes on burned slopes. Recent debris and mud flows have shown just how far material from the fire can travel. Ash and sediment have impacted water quality as far as the Mounds Road crossing on the Price River approximately 50 miles downstream of the fire. On July 10$^{th}$, 2012 Utah Division of Wildlife Resources (UDWR) fisheries crews visited the Price River near Farnham Dam. Numerous dead and dying Bluehead, Flannelmouth, and Razorback suckers (listed as Endangered under the Endangered Species

Act) were confirmed. Dead fish were the result of concentrated ash clogging the fish's gills. Downstream of this area water quality improved and no dead fish were observed. This stretch of stream also supports listed Colorado pikeminnow in the spring. UDWR also raised concerns about similar ash/sediment flows reaching the San Rafael River from Huntington Creek which includes the above listed species and Roundtail chub listed as Endangered.

**B. Emergency Treatment Objectives:**

The goal of the burned area emergency rehabilitation is to:

- Reduce threats to personal injury and/or human life to users of State Highway 31 by installing trash tracks and constructing overflow basins to catch/deposit debris from steep hillslopes, enlarging culverts above the highway, installing grade control to prevent headcutting and sediment deposition that could plug highway culverts, and rocking culvert catchments.
- Reduce threats to personal injury and/or human life by installing warning signs and road storm patrols.
- Mulch treatments are intended to mitigate soil loss, degradation to downstream water quality, and reducing energy flows that initiate flood events that impact other downslope and downstream values. Mulch treatments are to reduce risk to these values during the emergency period. Elevated soil erosion, sedimentation, runoff, and stream flows are expected to occur at decreasing rates over the next 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.
- Control expected invasion of noxious weeds within the area, especially along and adjacent to Forest roads and dozer lines used by fire equipment and in existing populations within the Seeley fire boundary.
- Minimize damage to system roads and trails within the fire boundary by cleaning existing or installing new drainage structures.
- Reduce sediment delivery into Huntington Creek and Nuck Woodward to protect water quality by repairing and installing drainage features on roads and trails.
- Warn users of Forest roads and trails of hazards present in the burned area. Roads and trails where appropriate, will be considered for temporary closure to protect public users of NF lands.
- 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 **90** % Channel **90** % Roads/Trails **90** % Protection/Safety **90** %

D. Probability of Treatment Success – Refer to Values at Risk (VAR) Spreadsheet

E. Cost of No-Action (Including Loss): – Refer to Values at Risk (VAR) Spreadsheet

F. Cost of Selected Alternative (Including Loss): – Refer to Values at Risk (VAR) Spreadsheet

G. Skills Represented on Burned-Area Survey Team:

| | | | |
|---|---|---|---|
| [**X**] Hydrology | [**X**] Soils | [ ] Geology | [**X**] Range |
| [ ] Forestry | [**X**] Wildlife | [ ] Fire Mgmt. | [**X**] Engineering |
| [ ] Contracting | [ ] Ecology | [ ] Botany | [ ] Archaeology |
| [**X**] Fisheries | [ ] Research | [ ] Landscape Arch | [**X**] GIS |

Team Leader: **John Chatel, Forest Fisheries Biologist**

Email:**jchatel@fs.fed.us** Phone:**208-737-3218** FAX: **208-737-3236**

**Team Members:**
John Chatel, BAER Team Leader, Sawtooth National Forest
Bill Goodman, Hydrologist, Regional Office
Kevin Duchow, Engineering, Sawtooth National Forest
Seth Wallace, Engineering, Manti LaSal National Forest
Daniel Luke, Engineering, Manti LaSal National Forest
Jan Curtis Tollesrup, Hydrologist, Manti LaSal National Forest
Bob Davidson, Soil Scientist, Manti LaSal National Forest
Kevin Albrecht, Wildlife Biologist, Manti LaSal National Forest
Jeff Jewkes, Wildlife Biologist/GIS, Manti LaSal National Forest
Del Orme, Recreation, Manti LaSal National Forest
Mark Chamberlain, Range Management Specialist, Manti LaSal National Forest
Pete Kilbourne, Resource Information Manager (GIS), Manti LaSal National Forest
Richard Giraud, Resource Information Manager (GIS), Manti LaSal National Forest

**Other Assistance**
Brian McInerney, Hydrologist, National Weather Service, Salt Lake Office
Cody Allred, Water Resource Engineer, PacifiCorp Energy
Nicole Nielson, Habitat Biologist, Utah Department of Natural Resources
Karl Ivory, Rangeland Management Specialist, Bureau of Land Management Price Field Office

H. **Treatment Narrative:**

## Protection/Safety Treatments:

**Road, Trail, and Campground Hazard Signs**

**Purpose of Treatment**: Ensure maximum visibility and readability of signs to warn public of hazards on trails, roads, and other recreation sites in or downslope of the burned area.
**General Description**: Install signs at roads, campsites, recreation sites and trailheads that enter or are within the burned area or provide access to trails within the burn; warning of increased hazard from falling burned trees, debris flows and flooding or to close sites and trails.
**Location (Suitable) Sites**: Any roads or trails entering burned area or campgrounds/trailheads that are at risk from post-fire hazards.
**Design/Construction Specifications**: Sign and Poster Guidelines for the Forest Service EM7100-15

**Closure of User Created Campsites and Routes**

**Purpose of Treatment**: User created campsites will be blocked with barriers where they are in danger of future debris flows. Unauthorized routes shall be ripped or pocked a reasonable length to discourage use, minimize weed spread, and protect soil productivity in burned areas from further erosion and ensure mulching areas are protected from motorized use.
**General Description**: Closure of Unauthorized route will consist of routes being ripped or pocked a reasonable length to discourage use and entrance barriers being constructed.
**Location (Suitable) Sites**: Any unauthorized route that enters or is within the fire perimeter that accesses areas of high or moderate burn severity.
**Design/Construction Specifications**:

1. General - Survey, design, and contract administration by USFS personnel. Use Forest Service Specifications for Construction of Roads and Bridges, Special Contract Provisions and Burned Area Emergency Response Treatments Catalog.
2. Closures should be installed in areas that provide for a safe and acceptable turn around, while maintaining the closure effectiveness.

## Debris Flow Protection Treatments

**Purpose of Treatment:** The severity of burn in some watersheds, combined with road location, high possibility of flash flooding and debris flow has increased the risk to road users. The purpose of these treatments is to provide protection for Highway 31 and other downstream values from increased flows and decrease the chances of debris and sediment blocking culverts, damaging structures and entering Huntington Creek. Roadway warning signs will be installed to protect life in areas determined to threaten life. Refer to the Engineering Assessment and Burned Area Emergency Response Treatments Catalog for additional treatment information.

**General Description**: Several debris flow protection treatments have been prescribed for high risk drainages in Huntington Canyon along Highway 31 in the Ferron Ranger District that have been directly impacted by wildfire. High to moderate severity burned areas in the steep canyons along the highway have greatly increased the potential for flash flooding and debris flows. Loss of water control from drainage structures and channels is a safety and property risk. Treatments include construction of overflow basins by existing flood plains, installation of natural log debris racks, rock armored overflow structure, flood warning signs, and storm inspection and response. The treatment described will work to control water flow and help protect life. During implementation an engineer or engineering technician should be on site to ensure proper placement and installation. Cooperation with required Forest Service personnel should also be implemented, including but not limited to a Cultural Resource Specialist and Biologist.

**Location (Suitable) Sites**: Engineer Canyon, South Hughes Canyon, Nuck Woodward Canyon, Pole Canyon

**Design/Construction Specification(s)**:

1. General - Survey, design, and contract administration by USFS personnel. Use Forest Service Specifications for Construction of Roads and Bridges, Special Contract Provisions and Burned Area Emergency Response Treatments Catalog.
2. Overflow Basins - After the BAER assessment team has designated potential treatment areas, review these field sites with the forest engineer and hydrologist. Key design considerations include channel gradient, design storm, overflow basin capacity, and material to be excavated at each site. Overflow basins will be constructed in natural flat areas adjacent to stream channels and utilize existing flood plains allowing peak flood flows to dissipate over a larger area, dropping large and small sediment away from stream channel and protecting identified downstream values. Excavated material will be left on site and used to construct berms around the perimeter of the basin and in critical locations to direct flows back to the natural stream channel. Topsoil shall be removed and stockpiled separately and spread back across overflow basin upon completion of work. Recommend seeding and willow planting to prevent erosion.
3. Natural Log Debris Racks – A debris rack is a barrier across the stream channel which stops debris too large to pass through a culvert. Debris racks are designed for small and medium floating debris. The storage area must be large enough to retain the anticipated type and quantity of debris expected in one storm or between cleanouts. Natural log debris racks are constructed from suitable on-site logs that are anchored to large trees adjacent to the stream channel. Large boulders may also be incorporated into the structures. Debris racks are usually vertical and at right angles to streamflow, but may be skewered with the flow or inclined with the vertical. The height of the racks should be minimized to avoid excessive material and water build up behind the structure. Debris racks should be spaced to allow access for equipment access for debris removal after runoff events. Refer to the BAER Treatment Catalog for additional implementation specifications.

4. Rock Armored Overflow – Rock armored overflows have been used on high standard roads including State highways and county roads to protect fill slopes in areas that burn frequently. The rock armored overflow is a permanent structure that is built with large rock placed in a stair step (shingled) design on excavated benches with either little or no grade along the revetment's length (longitudinal axis). The bottom tier should be buried to be flush with the existing ground. Armoring or paving the shoulder or berm that discharges into the spreader provides a smooth transition for surface flow and prevents erosion around the structure (Brown, personal communication). For additional stability concrete may be used to fill voids between rock armoring. Refer to the BAER Treatment Catalog for additional design and construction specifications.
5. Stream Grade Stabilization - Grade stabilizers are constructed from various materials, including logs, rocks, and wood. BAER assessment teams may recommend this treatment in areas where the loss of soil cover and increased runoff would result in channel downcutting. If grade stabilizers are proposed as an emergency treatment, a hydrologist familiar with their design, implementation, and effectiveness should design them to meet the particular site specifications. Refer to the BAER Treatment Catalog for design and construction specifications.

**Pump Big Rock Campground Vault Toilet**

**Purpose of Treatment**: There is a high likely that small scale debris flows will jump out of Huntington Creek and flow into the vault toilet. High spring flows in 2011 sent flows near the restroom. Projected post fire flows could be much higher. If this was to occur it float up to 1000 gallons of waste into the stream and contaminate flows for several miles.
**General Description**: A pumper truck would remove all waste from the vault this year and the cmapground would remain closed and be reevaluated in 2013 to determine if it is safe to reopen.
**Location (Suitable) Sites**: Big Rock Campground restroom is located along Huntington Creek below burn area.
**Design/Construction Specification(s)**: None

## Property Treatments:

**Campground Water System Protection**

**Purpose of Treatment**: High and moderate intensity burns occurred above several campground water systems. There is a high likelihood that rill erosion could bury spring collection areas and expose waterlines on the hillslope. This could contaminate the only water source for each campground. There is also a risk of higher flows in Huntington Creek eroding a streambank and the support for one of the poles supporting the waterline across the creek. High flows after the two debris flows have already eroded several feet from the bank putting ithe support at greater risk.
**General Description**: Hazard trees will be felled around all worksites to ensure worker's satefy. Work will involve enlarging and cleaning ditches around spring collection areas, construct water bars/check dams over waterlines, repair the silt fence around Left Fork of Huntington water system, and repair/replace the sediment liner at the Old Folks Flat spring collection area. These measures would also address the risk to human safety from contaminated water, further damage to Forest Service property. Large rocks or rootwads will be placed along the Huntington Creek streambank to protect the support system
**Location (Suitable) Sites**: Three water systems are within the burn area, Old Folks Flat water system, Stuart water system and Left Fork of Huntington water system.
**Design/Construction Specification(s)**: Place armoring along streambank to reduce and prevent erosion of roadway fill slope. Armoring may include placement of boulders, riprap, or gabion baskets. After the BAER assessment team has designated potential treatment areas, review these field sites to ensure suitability and determine the material required. Key design considerations include material size and amount. Ensure that no erosion occurs at the end of the armoring treatment. Use energy dissipators and

in-channel felling to transition from armored to natural streambank. Obtain any State or Federal stream alteration permits prior to implementation.

## Roads and Trails Treatments:

### Roadway Stabilization

**Purpose of Treatment**: The severity of burn in some watersheds, combined with road location, high possibility of flash flooding and debris flow has increased the risk to road and trail infrastructure. The purpose of these treatments is to increase roadway stabilization to pass large water flows and associated bedload and protect road template from increased flows and decrease the chances of washing road fill into adjacent drainage structures and flow channels. Dips and low water crossings will be placed down flow from culverts that will possibly fail. In situations where placement of rolling dips or low water crossing is not feasible the culvert will be replaced. The replaced culverts will be upsized to manage the increased flows. Roadway warning signs and gated closures will be installed to protect forest users where appropriate. Refer to the Engineering Assessment and Burned Area Emergency Response Treatments Catalog for additional treatment information.

General Description: Several road stabilization treatments have been prescribed for Forest Service Roads located on the Ferron Ranger District that may be have been directly impacted by post fire events. Treatments include waterbars and rolling dips, cleaning of culverts and catch basins, low water crossing cleaning and installation, culvert removal, seasonal gated closures, installation of flood warning signs, and storm inspection and response. Loss of water control from drainage structures and channels can cause a safety and property loss risk. When water leaves the drainage channels and engineered controls it can turn a roadway into a stream channel, making travel along or across the road dangerous and increasing the erosion to the roadway. During implementation an engineer or engineering technician should be on site to ensure proper placement and installation. Cooperation with required Forest Service personnel should also be implemented, including but not limited to a Cultural Resource Specialist and Biologist.

**Location (Suitable) Sites**: Nuck Woodward Road (FSR 5010), Wiregrass Bench/Bob Wright Road (FSR 50011), South Hughes Campground Road (FRS 50119), Old Folks Campground Road (FSR 50059), and Bridges Campground Road (FSR 53521)

**Design/Construction Specifications**:

1. General - Survey, design, and contract administration by USFS personnel. Use Forest Service Specifications for Construction of Roads and Bridges, Special Contract Provisions and Burned Area Emergency Response Treatments Catalog.

2. Cleaning of Culverts and Catch Basins - After the BAER assessment team has designated potential treatment areas, review these field sites with the forest engineer and hydrologist. Key design considerations include channel gradient, design storm, catchment basin capacity, and material to be removed at each site. Review the burn severity above the catchment basin and determine whether upslope treatments adequately mitigate the sediment delivered to the basin. For sediment removal projects identify:
    - Sediment disposal areas with stakes and flags.
    - Limits of excavation required.
    - Vegetation to be left undamaged.

    If you are removing a lot of material with numerous trucks, develop a traffic safety plan. Appropriate temporary road closures while equipment is working also may be necessary.
3. Low Water Crossings – A low-water stream crossing (LWSC) protects transportation infrastructure, reduces or eliminates the loss of control of water, and reduces the threat to water quality. LWSCs can be designed to accommodate aquatic passage. Construct LWSCs per Forest Service standards. Many design possibilities exist for natural fords. If the stream has a flat slope and a rock or gravel bottom, construct a natural ford by lowering the road grade to the stream bottom. USDA Forest Service Handbook direction notes the following design considerations: On streams with steep slopes, or with

rough, rocky, or soft sandy bottoms, level the bottom with a coarse gravel, or riprap. Install an endwall on the downstream edge of the road to hold the leveling layer in place. The endwall is both long enough and buried below the natural stream grade to ensure the walls will not be undermined. Allow sufficient length to prevent outflanking when the channel is moving both bedload and debris. Successful endwalls can be built with:

- Loose boulders.
- Rock-filled gabions.
- Jersey barriers.

4. Waterbars/Rolling Dips – Clearly identify the locations of the dips using stakes, GPS coordinates, and maps. Consider equipment travel distance between sites and whether the equipment would be transported or walked from each location. Identify logical treatment units that reduce travel time.
    - Identify the road segment to be treated and determine spacing guidelines.
    - Consider intervals suggested in guides based on erosion hazard rating, road grade, and road design speed.
    - Ensure that the existing design (spacing) of dips on the road may be sufficient especially when combined with an outslope or inslope to standard specifications.
    - Add dips to create a drivable overflow structure. Dip placement in this application is immediately below or downgrade of the culvert.
    - Perform any necessary clearing or grubbing to construct the dips as shown on the drawings.
    - Excavate and use borrow material during embankment; excavate drainage; shape the roadway (to 4-percent outslope unless otherwise designated in writing) in the drainage dips. The dip invert shall slope 4-percent greater than the road grade.
    - Construct dips with a skew angle to the line perpendicular to the centerline of the roadway, as designated in writing. The typical angle is 30 degrees.
    - Recommend armoring the surface and lead out.
5. Culvert Removal/Installation – Culvert removal should be used when predicted flows cannot be passed by the existing structures. This will reduce the probability of washout and loss of road structure. Removing and replacing culverts consists of removing undersized or non-functioning culverts and replacing them with larger culverts or new culverts that are capable of handling the predicted increase in runoff from burned areas.
6. Roadway Stabilization – Short sections of road will be stabilized to protect them from future flood events and from contributing additional debris to the State Hwy 31 downstream. The work will include rip-rap placement along streambanks where the road could be further undercut and collapse into stream channel. Additionally, hazard tree removal will be implemented along roadways for the protection of crews implementing BAER treatments. Where necessary, the road will be compacted and bladed to restore a drivable surface. Berms will also be removed so future runoff will not be channelized down the road. The road grade will also be raised through wet areas upslope and downslope of existing culverts. Some sections may be outsloped to drain water away from the road surface. Refer to Forest Service Specifications for Construction of Roads and Bridges
7. Streambank Armoring – Place armoring along streambank to reduce and prevent erosion of roadway fill slope. Armoring may include placement of boulders, riprap, or gabion baskets. After the BAER assessment team has designated potential treatment areas, review these field sites to ensure suitability and determine the material required. Key design considerations include material size and amount. Ensure that no erosion occurs at the end of the armoring treatment. Use energy dissipators and in-channel felling to transition from armored to natural streambank. Obtain any State or Federal stream alteration permits prior to implementation.
8. Cut Slope Stabilization – Remove landslide debris from road section. Excavate areas with slope fracturing back to stable subgrade at 2H:1V grade. Waste excess material along road shoulder in areas where sediment will not be carried into the stream.

9. Hazard Tree Removal – Treatment of hazard trees is conducted by force account or contract crews working on road stabilization. Refer to BAER Treatment Catalog for Construction Specifications and safety measures to be implemented during removal.
10. Gated Closures - Gated closures should be installed in areas that provide for a safe and acceptable turn around, while maintaining the closure. Gated closures should be used in conjunction with warning signs. Installation of Flood Warning Signs shall be in locations that provide advance warning to public entering the area. Warning signs should also be placed at gated closures.
11. Road Storm Patrols - The purpose of the monitoring is to evaluate the condition of roads for motorized access and to identify and implement additional work needed to maintain and/or repair damage to road surfaces and treatment structures to provide safe access across FS lands and minimize risks to property.

**Trail Drainage Maintenance**

**Purpose of Treatment**: The maintenance is needed to provide for maximum effectiveness of existing water bars to efficiently route water and sediment from the trails, thereby preventing erosion of trail surface and minimizing impacts to water quality. 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 steams.

**General Description**: Clean existing trail drainage structures on 13 miles of trails in the burn area to ensure increased runoff will not destroy trail tread and contribute sediment to steams. Fell hazard trees along trail where crews will be working to provide a safe work area.

**Location (Suitable) Sites**: Trails within burn perimeter that are likely to contribute significant volumes of sediment to stream system if drainage facilities are not adequate to increased runoff. Thirty-six miles are within the fire perimeter, and 13 miles of those miles are in areas of high or moderate severity burns.

**Design/Construction Specifications**:

1) As per FSH 2309.18

**Trail Drainage Construction**

**Purpose of Treatment**: To ensure drainage structures sufficiently divert water given expected increased runoff/overland flow, accelerated erosion, and increased sediment delivery. The need for erosion control is to protect trail resource investment and water quality.

**General Description**: Install 300 drainage structures to prevent erosion, mass wasting and debris flows that are predicted to occur following the burn. These measures would also address the risk to human safety, risk of loss of trail infrastructure. Fell hazard trees along trail where crews will be working to provide a safe work area.

**Location (Suitable) Sites**: Trails within burn perimeter that are likely to contribute significant volumes of sediment to stream system if drainage facilities are not adequate to increased runoff. Thirty-six miles are within the fire perimeter, and 13 miles of those miles are in areas of high or moderate severity burns.

**Design/Construction Specifications**:

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

**Monitoring:**

The purpose of the monitoring is to identify maintenance and/or repairs necessary for ensure implementation of the trail drainage maintenance and water bar construction was completed correctly to meet objectives of minimizing damage to the trail resource and reducing sediment delivery to adjacent

streams. Trail/recreation personnel will survey 13 miles of 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 were sediment is not delivered to nearby streams.

## Natural Resource Treatments:

## Land Treatments:

### Aerial Wood Mulching

**Purpose of Treatment**: This treatment is to help protect burn area slopes from, loss of soil productivity and FS property (campgrounds, trails, FS roads, Stuart Guard Station). In addition it will help reduce risk to downstream values both on and off NFS lands. 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 native seedbed and retain 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 mulch will be made on site and applied to the ground surface by helicopter 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: soil productivity and FS property (campgrounds, trails, FS roads, Stuart Guard Station), and other downstream values. Wood mulch is preferred treatment in the Engineer and Nuck Woodward drainages. Review of available literature indicates that this treatment will provide the best ground cover on these steep slopes and is most likely to stay on site since these upper slopes are prone to wind erosion and have no surface vegetation that can breakup wind velocities or capture lighter wind blown agricultural mulch. Heavier wood mulch can withstand wind speeds up to 40 mph vs. agricultrual straw that can withstand windspeeds only up to 15 mph (personal communication Pete Robichaud). Although the cost for wood mulch 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 properties at risk. It is realized that agricultural straw could be reapplied if it was blown off site but the increased costs for any reapplication and lower probability of success with the use of agricultural mulch it was determined to drop it as a viable treatment .

**Location (Suitable) Sites**: - Two micro-watershed treatment areas (Nuck Woodward - 499 acres and Engineer Canyon – 85 acres) totaling 584 acres have been identified for treatment. The selected sites have been identified based on the post-fire increased streamflow and potential to initiate and transport debris flows downstream to critical values at risk. Specifically, upper head slopes, ridge lines, and nose slopes were targeted for the purpose of reducing overland flow to the steep mid slope sections. Sites were selected based on 30-45% slopes in high and moderate burn severity and in Aspen mixed conifer, Douglas Fir, and/or Spruce/Fir. Refer to BAER Treatment Map for exact locations. The mulching would immediately add groundcover where currently exists. This mulch groundcover would reduce runoff and erosion.

**Design/Construction Specification(s)**:

1. Site selection criteria - Provide 50% ground cover that is evenly distributed on the hillslopes.
2. Wood mulch application rate - Wood mulch at a rate of 6 tons/acre to achieve 50% ground cover.

**Monitoring:**

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 mulch. Transects would be completed within each treatment area using a pace-step or point intersect methodology.

**Noxious Weeds EDRR**

**Purpose of Treatment:** Reduce the potential for expansion of known noxious weed infestations in susceptible burned areas due to fire related disturbance and prevent potential increases in weed density due to existing infestations. Field reviews by Forest Service BAER team specialists indicate that there is a high risk of noxious weed invasion. Pre-fire weed infestation within and adjacent to the Seeley fire on Forest Service lands are estimated at 1088 acres. This includes 4 noxious species and one invasive species including Musk Thistle, Scotch Thistle, Hoary Cress, Hounds Tongue, and cheatgrass. Current treatment efforts are focused on containing these species. Efforts to prevent weed infestation and spread of species from both on and off Forest included a wash station for extended attack equipment during fire suppression activities. However, this station was not in place until the third day of the fire and did not include cleaning initial attack equipment. Additionally, extended attack equipment was only washed at check-in and check-out. Vehicles traveling along infested roads or cross-country were not washed daily and could have served as vectors for these invasive species. The Seeley Fire affected a total of 47,556 acres of non-forested and forested vegetation. Following this magnitude of disturbance, noxious and invasive plant species will compete aggressively for space and nutrients with desired native plant species (Goodwin et al. 2002). Ground disturbing activities such as fire lines, dozer lines, fire camps, and helispots provide a disturbance that favors colonization of noxious and invasive species. Fire Suppression (P code) rehabilitation efforts will include returning all hand lines and mechanical lines to natural grade and will include seeding with native grass species and sagebrush. These road access routes and trails into the burn pose a high potential for infestation and spread of invasive Species into the burned area.

**General Description:** Musk thistle infestations occur throughout the burn area, but typically were not found in the areas that were severely or moderately burned. Most of the infestations are in or near disturbed areas (roads, trails, livestock congregation areas, etc) adjacent to the severely or moderately burned areas. Hoary Cress infestations are minor (<2 acres) along the Trough Springs Ridge road. Infestations occur along roads, trails inside and directly adjacent to the fire perimeter. Scotch thistle is known to occur in only one spot within the fire perimeter. This infestation is in North Hughes canyon at the top of a large burned area. Hounds Tongue infestations occur throughout the burn area, but typically were not found in the areas that were severely or moderately burned. Most of the infestations are in or near disturbed areas (roads, trails, livestock congregation areas, etc.) adjacent to the severely or moderately burned areas.

**Location (Suitable) Sites:**

Existing known weed infestations within and directly adjacent to the Seeley Fire burned area on Forest and private land.

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

**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 Seeley Fire and to prevent potential new infestations resulting from BAER emergency response action.

When monitoring actions are initiated, Forest, EDRR crew, or CWMA personnel will be equipped to immediately treat to eradicate or control infestations of noxious weeds (i.e. hand pulling, herbicide application, biological agent control, seeding of native species). This allows for the immediate treatment and eradication of infestations as they are discovered. BAER funding authorization will be used for the first year following fire containment to meet objectives above. Existing infestations will

also be treated as prescribed by CWMA plans at the same time. As appropriate, these actions may be carried out under a combination of BAER and other management authorities. Treatment and monitoring activities occurring after the first year following the fire will be carried out under non-BAER authorizations.

**Monitoring of prevention requirements**

During BAER treatment activities authorized individuals will need to monitor to insure that:

1. All equipment and vehicles (Contract and USFS) brought into the site are cleaned before beginning earth-disturbing activities. A pre-approved wash station will be identified by the BAER Implementation Team Leader (preferably in the same location as the suppression wash station to focus post-implementation treatment).
2. All seed purchased for Rehab activities will have certification tags showing seed has been tested for State listed noxious weeds.
3. Materials such as hay, straw, seed, or mulch that are used for rehabilitation and reclamation activities shall be free of noxious weed seed, and shall comply with the 1995 weed-free forage special order against use of non-certified hay, straw, or mulch. Materials that are not covered under a weed seed free certification, and that have the potential to contain noxious weed seed, shall be inspected and determined to be free of weed seed before purchase and use.
4. Staging of equipment and/or rehabilitation materials will not be allowed in known infestation sites.

**Monitoring areas disturbed by suppression actions and the burned area**

Monitoring will be at an intensity and frequency to identify the spread or occurrence of weed infestations following the fire event and recovery. This monitoring will be funded in part by BAER and in part through other authorities where pre-fire management has taken place through the Forest Service or CWMA. Monitoring will be conducted for the first growing season (starting 2013) 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. Rolfson Helipad, Roads, and trails within the fire perimeter and immediately adjacent. All weeds will be treated for eradication upon discovery.
2. All hand line associated with suppression. Helispots (1 designated), drop sites and water dip sites.
3. Selected locations within the cattle and sheep grazing allotments. Locations to be determined and implemented by Range Staff, Ferron Ranger District.
4. Wildland Urban Interface (Electric Lake, and Clear Creek)

These sites will be monitored by crews on foot or by vehicle as appropriate.

**Part VI – Emergency Stabilization Treatments and Source of Funds** **Interim # 1**

| | | | NFS Lands | | | | Other Lands | | | All |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Unit | # of | | Other | # of | Fed | # of | Non Fed | Total |
| Line Items | Units | Cost | Units | BAER $ | $ | units | $ | Units | $ | $ |
| | | | | | | | | | | |
| **A. Land Treatments** | | | | | | | | | | |
| Noxious Weed Treatment | Acres | 187 | 285 | $53,295 | $0 | | $0 | | $0 | $53,295 |
| Debris Flow Protection Treatments | Each | 145,240 | 1 | $145,240 | $0 | | $0 | | $0 | $145,240 |
| Aerial Wood Mulch | Acres | 2,170 | 584 | $1,267,280 | $0 | | $0 | | $0 | $1,267,280 |
| *Subtotal Land Treatments* | | | | $1,465,815 | $0 | | $0 | | $0 | $1,465,815 |
| **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** | | | | | | | | | | |
| Road Drainage Maintenance | Each | 38,061 | 1 | $38,061 | $0 | | $0 | | $0 | $38,061 |
| Roadway Stabilization | Each | 164,960 | 1 | $164,960 | $0 | | $0 | | $0 | $164,960 |
| Closures for Users Created Sites | Each | 63,500 | 1 | $63,500 | $0 | | $0 | | $0 | $63,500 |
| Trail Drainage Maintenance | Each | 25,494 | 1 | $25,494 | $0 | | $0 | | $0 | $25,494 |
| Trail Drainage Construction | Each | 60,505 | 1 | $60,505 | $0 | | $0 | | $0 | $60,505 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Road & Trails* | | | | $352,520 | $0 | | $0 | | $0 | $352,520 |
| **D. Protection/Safety** | | | | | | | | | | |
| Pump toilet Big Rock Group Site | Each | 200 | 1 | $200 | | | | | | |
| Campground Water System Protection | Each | 11,662 | 1 | $11,662 | | | | | | |
| Trail, Road, and Campground Signs | Each | 37950 | 1 | $37,950 | $0 | | $0 | | $0 | $37,950 |
| *Insert new items above this line!* | | | | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Structures* | | | | $49,812 | $0 | | $0 | | $0 | $37,950 |
| **E. BAER Evaluation** | | | | | | | | | | |
| Assessment Team | Report | 87,864 | 1 | --- | | | $0 | | $0 | $0 |
| *Subtotal Evaluation* | | | | --- | $0 | | $0 | | $0 | $0 |
| **F. Monitoring** | | | | | | | | | | |
| Noxious Weeds | Report | 0 | 0 | $0 | $0 | | $0 | | $0 | $0 |
| Aerial Straw Mulch | Report | 0 | 0 | $0 | $0 | | $0 | | $0 | $0 |
| Trail Drainage | Report | 0 | 0 | $0 | $0 | | $0 | | $0 | $0 |
| Road Storm Patrols/Drainage | Report | 0 | 0 | $0 | $0 | | $0 | | $0 | $0 |
| *Subtotal Monitoring* | | | | $0 | $0 | | $0 | | $0 | $0 |
| | | | | | | | | | | |
| **G. Totals** | | | | $1,868,147 | $0 | | **$0** | | **$0** | **$1,856,285** |
| Previously approved | | | | $484,072 | | | | | | |
| Total for this request | | | | **$1,384,075** | | | | | | |

## PART VII - APPROVALS

1. /s/ Alleen Rowley — July 23, 2012
   ALEN ROWLEY
   Acting Forest Supervisor (signature) — Date

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