

BURNED-AREA REPORT

(Reference FSH 2509.13)

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

☐ 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)

A. Fire Name: Lost Lake

B. Fire Number: UT-FIF-000082

C. State: Utah

D. County: Wayne

E. Region: 4

F. Forest: Fishlake National Forest

G. District: Fremont River

H. Fire Incident Job Code: P4GWX0 (0408)

I. Date Fire Started: June 3, 2012

J. Date Fire Contained: June 13, 2012

K. Suppression Cost: \$3,245,588 as of June 25, 2012; fire is still not controlled.

L. Fire Suppression Damages Repaired with Suppression Funds

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

M. Watershed Number: 140700030301 Boulder Creek-Fremont River (HUC6)

N. Total Acres Burned: 2,075
[2,075] NFS Acres [0 BLM] Other Federal [0] Private

O. Vegetation Types: Spruce/Fir (481 Acres), Spruce/Fir/Rubblelands (180 Acres), M
Conifer/Aspen (958 Acres), Ponderosa Pine (114 Acres), Seral PJ (134 Acres), Stable PJ (183 Ac
Black Sagebrush/Low Sagebrush (21 Acres), Riparian Zones/Wetland Areas (4 Acres)

P. Dominant Soils: Scandard family—cobblely, sandy, and gravelly sandy loam with 30% rock fragments (46%); Cundiyo-Scout family complex—cobblely loam and cobblely sandy clay loam with 15-50% rock fragments 23%; Rubble Land-Illiano family—stoneily loam with about 75% rock fragments, shallow colluvial (9%); Lupinto-Bruman, moist families-Rock outcrop complex—deep and well drained, cobblely loam with gravelly clay loam subsurface, 25-50% rock fragments; (8%);

Q. Geologic Types: Colluvial Deposits from Tertiary Volcanic Rocks, Arapien Shale, Alluvium and Landslides....Arapien Shale (219 Acres), Alluvium and Colluvium (47 Acres), Landslides (1,809 Acres)

R. Miles of Stream Channels by Order or Class: 1st order-16.3 miles; 2nd order-13 miles; 3rd order-5 miles

S. Transportation System

Trails: 5.0 miles **Roads:** 2.7 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 63 (3%) (**very Low/ unburned**) 537 (26%) (**low**) 770 (37%) (**moderate**) 693 (33%) (**high**)

B. Water-Repellent Soil (acres): 1,097

C. Soil Erosion Hazard Rating (acres): 1956 (**low**) 119 (**moderate**) 0 (**high**)

D. Erosion Potential: 5.37 tons/acre

E. Sediment Potential: 3,398 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 60

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

D. Design Storm Duration, (hours): 3

E. Design Storm Magnitude, (inches): 0.61

F. Design Flow, (cubic feet / second/ square mile): 13.7

G. Estimated Reduction in Infiltration, (percent): 53

H. Adjusted Design Flow, (cfs per square mile): 21

PART V - SUMMARY OF ANALYSIS**A. Describe Critical Values/Resources and Threats:****LOST LAKE WILDFIRE****BAER / CRITICAL VALUES-AT-RISK SUMMARY TABLE**

Much of the burned-area is currently prone to very high flooding hazards; specifically in the Bullberry Creek and tributaries to Cottonwood Creek. The values at risk shown below were assessed based upon the post fire conditions and likelihood of post fire events. The BAER critical values are; human safety, municipal culinary water supply and ground water protection zone, agricultural water supply, road and trail infrastructure, soil productivity, hydrologic function, and native / naturalized communities where invasive species and noxious weeds are absent. These values are threatened by the post-fire response to short duration, high intensity precipitation events. The magnitude of consequences is moderate to road and trail infrastructure, municipal and agricultural water sources, human safety and major to soil productivity. Overall, the assessed risk is very high soil productivity and high for human life and safety, property, and culinary/agricultural water sources.

HUMAN LIFE AND SAFETY**Human Life and Safety.**

Users of FS Transportation System (Roads) – There are likely flooding hazards to Bullberry Creek and Coleman Reservoir Roads. These roads are used by the public for access to NF lands. – Possible Probability of Damage or Loss/ Major Consequences... **HIGH RISK**

Users on or in Private Property – Flooding to private and county transportation surfaces (i.e. Donkey Flats Road), occupied structures, and overall safety of the general public along the Cottonwood Creek and Bullberry Creek drainages –Possible Probability of Damage or Loss/ Moderate Consequences... **INTERMEDIATE RISK**

Public trails and use areas- There are several public access areas that have many burned hazard trees. Hazard trees are located at trailheads, dispersed recreation sites, and along trails and roads – Possible Probability of Damage or Loss/ Major Consequences... **HIGH RISK**

PROPERTY

Buildings, water systems, utility systems, road and trail prisms, residences, ponds, dams, wells or other significant investments.

Forest Roads – Likely Probability of Damage or Loss / Moderate Consequences... **HIGH RISK**

There are approximately 8 miles of transportation surfaces in the burn perimeter (roads & trails) occurring on NFS Lands. The existing roads and trails are considered to be at-risk from flooding hazards, and debris flows due to the size and severity of the recent wildfire event. In particular the road in Bullberry Creek drainage that accesses Coleman Reservoir is at risk as fire severity was high to moderate along 1.93 or 73% of the 2.67 miles impacted. The Donkey

Flat road, north and down drainage of the fire, is at risk to post fire debris flows from unnamed face drainages that burned at high severity. These surfaces will be subject to accelerated rates of soil erosion for the next 2 to 4 years during inclement weather conditions. Most of the roads and drainage structures require normal maintenance, cleaning or repairs to function properly and accommodate anticipated additional runoff.

Forest Trails – Likely Probability of Damage or Loss / Moderate Consequences ... HIGH RISK

4.96 miles of trails are within the burn perimeter with 0.61 miles of trail in low fire severity areas. The remaining 4.35 miles of trails were burned at moderate and high severity. These trails are at risk from debris flows and accelerated erosion rates during summer thunderstorm climatic events. Hydrophobic soils will add to the severity of the erosion rates. Effects to trail surfaces from erosion will remain for 2 to 4 years until soils stabilize.

County Roads - Likely Probability of Damage or Loss / Moderate Consequences ... HIGH RISK

There are several forest access roads that lead to NFS lands below the burn. Cottonwood Creek and its tributaries along with the Bullberry Creek and tributaries intersect these roads in several locations off forest. It is likely the sediment and debris flows will impact existing culverts and drainage structures along these roads. The headwaters of an ephemeral drainage to Cottonwood Creek burned at moderate and high severity.

Structures on Private Lands near NFS burned lands - Possible Probability of Damage or Loss / Moderate Consequences ... INTERMEDIATE RISK

Primary residences and outbuildings along Bullberry Creek and Cottonwood Creek drainages are at risk to possible flooding following precipitation events. Moderate and High severity burn zones in the headwaters of these drainages will accelerate sediment and debris flow. Existing culverts may not handle the flows.

Upper and Lower Holding Ponds for Teasdale Water System – Likely Probability of Damage or Loss / Moderate Consequences... HIGH RISK

Holding ponds may be affected by flooding or sediment input. Water quality may be affected as well as storage capacity. The holding ponds are part of the irrigation system for the Teasdale area.

Culinary Water System – Unlikely Probability of Damage or Loss / Major Consequences ... INTERMEDIATE RISK

The sole source of culinary water for the town of Teasdale originates within the burn perimeter. From the 5 spring boxes water is diverted to a pipe and is conveyed to two water tanks in Teasdale. The springs are located along the western flank of the fire on the upslope edge of a high burn severity area. There is an unburned section directly above the spring boxes that should provide protection from sedimentation and debris flows. Approximately ¼ mile of the 4.26 mile pipeline is within the burn. Impacts to these spring boxes are unlikely but the consequences are major as this is the sole source for culinary water for Teasdale. The water lines are at risk from flooding events where the line is near channels below the fire.

Agricultural Water System - Likely Probability of Damage or Loss / Minor Consequences ... LOW RISK

A series of ditches collect water off of the Bullberry Creek tributaries which flows into Coleman Reservoir during the winter months. All of these ditches occur in the burn perimeter. It is likely that accelerated post burn flows will breach the banks of these ditches and cause bank failure. Bullberry Creek mainstem conveys water from April through November to a series of irrigation ditches in the Teasdale area. The two holding ponds mentioned above are part of this system.

NATURAL RESOURCES

Soil productivity on burned NFS lands.

Potential loss of soil due to post fire runoff events. **Likely Probability of Damage or Loss/ Moderate Consequences... HIGH RISK**

Following the wildfire, erosive conditions exist due to the burning of ground cover, coarse woody debris and soil subsurface organic material. Loss of topsoil negatively affects ecological function for:

- native seed bank and native species recovery
- root growth and soil stability

With BARC imagery and on the ground assessments and verification the BAER team concluded that 70% of this incident was subjected to Moderate and High Severity Burns. Approximately 693 acres were mapped as high burn severity and 770 acres burned at moderate severity. The Bullberry Creek subwatershed was burned at moderate and high severity (69%) with the headwaters burning at high severity and soils are hydrophobic. The lack of ground cover and hydrophobic soils will likely increase surface runoff, flooding, and erosion during typical summer monsoon rain events. The Coleman Reservoir subwatershed burned at 86% moderate and high severity. Increased sedimentation from soil movement is expected. Lake and reservoir capacities will be reduced and water quality will be affected.

Hydrologic function on burned NFS lands - Likely Probability of Damage or Loss/ Moderate Consequences ...

HIGH RISK

An adverse change to hydrologic function is expected due to the large contiguous areas burned at moderate and high severity. Fire severity BARC imagery indicated that the Bullberry Creek and Coleman Reservoir subwatersheds had 69% and 86% burned at moderate and high severity. Hydrophobic soils are found in the headwaters of both subwatersheds and increased flows are expected. Flooding and excess sediment can be expected throughout the affected drainages with movement of large amounts of sediment in the ephemeral drainages during climatic events. According to ERMIT model runs, 5.37 tons per acre of sediment delivery is possible during the first year following the fire.

Ground Water Source Protection Zone – Possible Probability of Damage or Loss / Moderate Consequences...

INTERMEDIATE RISK

Ground water recharge may be affected by hydrophobic soils where the ground water recharge zone intersects with high and moderate burn severity portions of the fire. The entire ground source water protection zone was not involved in the fire but the amount impacted is expected to have an effect on recharge rates. These impacts should be short-term and effects would be present during summer precipitation events.

Native or naturalized communities on NFS land where invasive species or noxious weeds are absent or present in only minor amounts. Possible Probability of Damage or Loss / Moderate Consequences ... INTERMEDIATE RISK

The north slope of Boulder Mountain is a **noxious weed free** area. It is possible that equipment used for suppression transported noxious and/or invasive weed species into the area. Roads, parking areas, drop points and spike camps are areas of primary concern for introduction.

CULTURAL AND HERITAGE RESOURCES

Cultural resources on NFS lands which are listed on or potentially eligible for the National Register of Historic Places.

Unlikely Probability of Damage or Loss / Minor Consequences... VERY LOW

Non BAER Values At Risk

Colorado Cutthroat Trout Habitat

Colorado River Cutthroat Trout (CRCT) are considered a USDA – Forest Service / Intermountain Region sensitive species. They have been petitioned for listing as a threatened species several times. To help prevent the need for that listing, a Conservation Agreement and Strategy was developed to guide their management, including protection of populations and habitat from threats, habitat improvements and the active restoration of new populations. The USDA – Forest Service / Intermountain Region is a signatory to this document. The

Bullberry Lakes have a conservation population of CRCT combined with a sport fishery for tiger trout. High severity burns in the headwaters of Bullberry Creek combined with soil hydrophobicity is likely to lead to increased sediment into the Bullberry Lakes. Erosion rates that are expected on the Lost Lake Fire have resulted in elimination of fish populations and long term (>10 years) alterations to aquatic habitat in similar situations. Sedimentation will limit lake capacity and impair water quality.

Big Game Forage and Cover

Even though big game and their habitat are not considered critical values in BAER, forage and cover values in crucial winter and summer ranges have been severely reduced or lost on about 2,000 acres. The value of these ranges could be at further risk due to the moderate to high potential for soil loss on highly erodible soils that could lead to sterile soils, entrenched streambeds and sediment transport into water bodies. It is therefore important to encourage immediate re-vegetation in areas that have been severely burned and occur on unstable soils through mulching and aerial seeding, using a seed mix of preferably native species.

B. Emergency Treatment Objectives:

- Reduce threats to personal injury and/or human life of Forest visitors in and immediately adjacent to the fire by installing warning signs and performing storm patrols.
- Warn users of Forest roads, trailheads, and trails of hazards present in the burned area.
- Mitigate potential post fire soil losses through increasing post-fire ground cover with mulch and with vegetation treatments.
- Reduce the likelihood of invasive and noxious species colonizing the burn area through revegetation and early detection rapid response treatments.
- Reduce potential for runoff through broadcast seeding. This treatment will be used to stabilize existing ground conditions on severely and adjacent moderately burned terrain. Seeding is to maintain soil productivity, uphold the ecological integrity of our sites, and limit the amount of sediment available for transport into waterbodies.
- Control expected invasion of noxious weeds within the area, especially along Forest roads, drop points, helispots, and spike camps used by fire equipment and in existing populations within the fire boundary (Use of P Code will be used as appropriate).
- Minimize threats from additional post fire runoff to system roads and trails within the fire perimeter by cleaning existing drainage structures.
- Minimize threats from post fire runoff to property adjacent and downstream from the fire through storm patrols and cleanouts of drainage structures (culverts) as necessary following rain events.
- Identify appropriate monitoring activities that estimate the effectiveness of emergency stabilization treatments and identify necessary maintenance and continuation of other approved BAER activities.

C. Probability of Completing Emergency Stabilization Treatments Prior to a Storm Damaging Event:

Land	65 %	Channel	NA	Roads / Trails	85 %	Protection / Safety	90 %
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D. Probability of Treatment Success: (on NFS lands)

Treatment Types:	← Years After Treatment →		
	1	3	5
Land Treatments (seeding)	60 %	70 %	75 %

Land Treatments (mulching)	70 %	80 %	80 %
Channel Treatments (None)	NA	NA	NA
Road / Trail Treatments (drainage and culverts)	85 %	85 %	85 %
Protection / Safety Treatments (signs)	90 %	90 %	90 %

E. The Cost of Taking No - Action: \$3,821,900

The values at risk directly lost through No-Action includes: damage to water quality and availability, loss of soil productivity, damage to structures, roads, trails, utilities, and human life due to change in hydrologic and hillslope conditions. Cost estimates were obtained through consultation with Forest Service engineers, hydrologists, soil scientists, and botanists and include repair/reconstruction costs and where appropriate replacement costs.

Values-At-Risk

Estimated Costs

Potential damage/loss to NFS roads (Equipment and operator time to re-grade road surfaces + fill material + culvert replacement/cleaning)	\$280,500
Potential damage/loss to NFS trails (Number of reconstruction items i.e. trail miles to build, waterbars, check dams, ditches, slope treatments needed in H and Mod burn areas x unit cost including labor)	\$113,400
Potential damage/loss to county roads (Estimates claim cost for losses caused by fire flood damage includes culvert replacement/repair and road grading)	\$175,000
Potential damage and or loss to structures on private lands adjacent to or down drainage from the fire (Estimates potential damages such as flooded basements, and gravel driveway replacement)	\$110,000
Potential impairment/loss to culinary and agricultural water systems (Equipment and operator time to clean collection ponds, ditch reconstruction and repair or replacement of culinary pipelines)	\$425,000
Potential damage or loss of soil productivity from erosion following climatic events (Ecological harm estimate in dollars lost from soil erosion and long term nature of the consequences based on expert opinion)	\$2,000,000
Reduction of hydrologic function on burned NFS lands	\$600,000
Alterations to ground water protection zone (Loss of water to be used ac/ft x montly use rate)	\$108,000
Introductions of noxious weeds to native or naturalized plant communities on NFS lands used during suppression efforts (personnel costs + equipment + chemicals for detection and treatment)	\$10,000
Total	\$ 3,821,900

F. The Cost of the Selected Alternative: \$1,660,946 (including loss)

Values-At-Risk	Estimated Costs
Potential damage to NFS roads. Seeding and mulch treatments are estimated to be 65% effective in reducing frequency of runoff and slowing erosional processes for 1-2 year storm events. (35% failure rate of \$280,500 + culvert cleaning and replacement + % of cost of seed and mulch)	\$137,104
Potential damage to NFS trails. Seeding and mulch treatments are estimated to be 65% effective in reducing frequency of runoff and slowing erosional processes for 1-2 year storm events. (35% failure rate of \$113,400 + cost of trail stabilization treatments + % of cost of seed and mulch)	\$85,069
Potential damage to county roads. Seeding and mulch treatments are estimated to be 65% effective in reducing frequency of runoff and slowing erosional processes for 1-2 year storm events. (35% failure rate of \$175,000 + % of cost of seed and mulch)	\$97,379
Potential damage and or loss to structures on private lands adjacent to or down drainage from the fire. Seeding and mulch treatments are estimated to be 65% effective in reducing frequency of runoff and slowing erosional processes for 1-2 year storm events. (35% failure rate of \$110,000 + % of cost of seed and mulch)	\$74,629
Potential impairment/loss to culinary and agricultural water systems. Seeding and mulch treatments are estimated to be 65% effective in reducing frequency of runoff and slowing erosional processes for 1-2 year storm events. (35% failure rate of \$425,000 + % of cost of seed and mulch)	\$184,189
Potential damage or loss of soil productivity from erosion following climatic events. Seeding and mulch treatments are estimated to be 65% effective in reducing frequency of runoff and slowing erosional processes for 1-2 year storm events. Restricting domestic livestock use to burned areas for protection of seeded areas would be needed. (35% failure rate of \$2,000,000 + % of cost of seed and mulch + temporary fence costs)	\$759,529
Reduction of hydrologic function on burned NFS lands. Seeding and mulch treatments are estimated to be 65% effective in reducing frequency of runoff and slowing erosional processes for 1-2 year storm events. (35% failure rate of \$600,000 + % of cost of seed and mulch)	\$246,129
Alterations to ground water protection zone. Seeding and mulch treatments are estimated to be 65% effective in reducing frequency of runoff and slowing erosional processes for 1-2 year storm events. (35% failure rate of \$108,000 + % of cost of seed and mulch)	\$72,258
Introductions of noxious weeds to native or naturalized plant communities on NFS lands used during suppression efforts.	\$4,660

Total	\$ 1,923,873
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G. Skills Represented on Burned-Area Survey Team:

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

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

LAND TREATMENTS

AERIAL MULCHING

The mulching treatments were determined to be the minimum necessary to protect critical values, as defined in FSM Interim Directive 2523.1.

Purpose of Treatment: Reduce risk to loss of soil productivity and hydrologic function and to protect property including roads, trails, culinary and agricultural water sources and infrastructure, and private structures. Mulching would also provide protection to public users in the area by reducing the erosional rates and intensities. Apply agricultural straw mulch to the ground surface to achieve a continuous cover of uniform thickness, as specified below, to replace ground cover consumed by the fire. Ground cover is needed to maintain soil moisture, accelerate recovery of native vegetation, to protect any seed remaining onsite, and to improve success of stabilization seeding treatments. In addition, the organic mulch will protect soil from solar heating and drying, thereby improving the ability of seeds to germinate.

Location of Suitable Sites for Treatment: [This interim 1 request includes thean increase of aerial mulching costs from \\$677 /ac to \\$906/ac. The costs estimates are consistent with contract bids from other post fire aerial mulching projects in Utah.](#) The treatment unit is 693 acres in total but treatments will only be on slopes of 20-40% which equates to 300 acres actually treated within the 693 acre total. The locations are areas that burned at high severity. Treatments are placed in headwaters, along perennial streams and on slopes of 20 to 40% where greatest probability of erosion is expected. Refer to BAER Treatment Map for the exact locations.

Design Specifications:

- Treat areas in designated units with “High” soil burn severity. Do not treat areas that have needles in trees, exposed rock outcrops, or slopes greater than ~40%.

- Straw application rate: Apply mulch to achieve a continuous cover of uniform thickness on areas of 20-40% slope within the mulch polygons of treatment area at a depth of less than 2.0 inches. Application rate will be approximately 1 ton / acre (2,000 pounds). This is about 0.25 inches or 3 straw shafts deep. Aerial application may not achieve desired ground cover, therefore ground crews will likely be needed to spread straw clumps by hand in select locations in each treatment unit. Discussion with Pete Robichaud on October 14, 2010 regarding a rate of 0.5 tons/acre identified that patching or stripping has not proved to be successful in the past. It was determined that the energy created between patches or strips of treated area overwhelms the next treated area and/or undercuts with rilling.
- Straw must conform to State Department of Agriculture (SDA), Certified Noxious Weed Free Standards for Noxious Weed Free Forage and Straw (NWFFS). All straw provided must have been planted and harvested during the 2011(2012 maybe preferred) growing season. Straw shaft length will not exceed 12 inches. Suitable straw includes barley, rice, and wheat grasses.
- The straw must be applied dry (less than 12 percent internal moisture content) to ensure proper dispersal during aerial applications. The Forest Service may randomly test bales using a moisture probe.

This treatment is intended to achieve three sequential objectives:

- Improve conditions to protect soil productivity by replacing ground cover burned in the fire. Replacing ground cover will: a) decrease erosion by interrupting raindrop impact and surface soil detachment; and b) increase hillslope obstructions to decrease slope lengths which mitigate accelerated overland flow, thereby decreasing sediment delivery. Mulching also helps to protect the native seedbed and retain moisture on the burned slopes to facilitate vegetative recovery of the treatment areas.
- Decrease overland flow and erosion from high soil burn severity areas upslope of trails, roads, and Bullberry Creek which can intercept surface runoff and result in damage and/or loss of infrastructure.
- Decrease sedimentation from burned-areas and trails upslope of streams, lakes and reservoirs.

The mulching treatments are predicted to lower the estimated soil erosion and subsequent sediment delivery to the streams by up to about 1/2. Mulching will also 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 treatments in the headwaters of the streams can protect a much larger downstream area from cumulative runoff and sedimentation.

The purpose of the mulching treatment is to reduce the delivery of sediment from severely burned hillslopes to avoid sediment bulking of flows compromising road, trail, culinary water and irrigation infrastructure.

Implementation Monitoring

Visually inspect randomly selected mulch treatment units for proper application rate and uniform thickness during / immediately after treatment to ensure treatment/contract specifications are met prior to completing treatment. In each unit, measure percent ground cover using a 100 foot pace transects.

BROADCAST SEEDING

Purpose of Treatment: The purpose of this treatment is to provide species diversity, soil stabilization and effective ground cover from seeded grass vegetation. Germination would occur in year one and increase

through years two and three. Seeding will help to prevent soil loss and help to minimize down slope effects to lower watersheds that result from soil erosion by providing effective ground cover more rapidly than these ecological systems would provide without treatment. The pre-burn conditions of the landscape lacked forbs and grasses due to the density of tree species. Long term soil production and hydrologic function is expected to be severely impacted by soil erosion following this wildfire if no seeding in these proposed treatment areas are done. A broader range of grass species is used in this proposal to maximize germination and establishment on a broader range of microsites (e.g. slope, aspect, and surface types) within the proposed treatment area.

General Description: Aerially seed with grasses 693 acres to increase the likelihood of success for soil stabilization, establish vegetation in high and moderate severity burn areas and to prevent additional soil productivity loss. The seeding applications are most effective beyond the first growing season. However, because of the condition of the pre-burn vegetation relying on residual seeds is unlikely to be successful. The acres described above include some of the acres proposed for mulching. These acres could be seeded at a lower rate of spread than those that are not receiving the mulch treatment. However, the need to provide seed for ecological health, in the form of species diversity, is still present.

Location (Suitable) Sites: Moderate to high severity burn areas of the Lost Lake Fire.

Design Specifications:

The following seed mixes were developed specifically for **EMERGENCY STABILIZATION TREATMENTS**. Our seed mixes will help to restore ecosystem function and protect against the rapid increase of invasives. The mixes are entirely comprised of native species.

The seed purchased will be certified to the variety claimed. Also, the mixes will be certified that NO noxious weed seeds are present. Pure live seed (PLS) equals the percent of purity times the percent total germination ($PLS = \% P \times \% TG$).

Price estimates were obtained from Utah Division of Wildlife Resources seed warehouse in Ephraim, UT. Actual costs may vary depending on availability at time of purchase from the successful bidder. The following table shows the pounds / acre of seed (PLS) that would be used in each mix. Cost for aerial application is estimated at \$45 per acre.

Native or Introduced	Species to be Seeded	Lower Elevation Mix	Upper Elevation Mix
< ---- Pounds / Acre ---- >			
N	Big bluegrass "Sherman"	0.75	0.5
N	Bluebunch wheatgrass "P-7"	3.0	3.0
N	Timothy NVS	0	0.75
N	Indian Ricegrass "White River"	2.5	0
N	Sandberg bluegrass "UP Colorado"	2.0	2.0
N	Mountain brome "Bromar" or "Garnet"	0	2.5
N	Thickspike wheatgrass "Critana"	2.5	2.0

N	Great Basin Wildrye “UDWR Tetra”	1.5	0
N	Idaho Fescue “Joseph”	0	0.5



Total Pounds / Acre	12.25	11.25
Total Seeds / ft ² <u>1</u> /	74	82
Estimated Seed Cost / Acre	\$56.04	\$45.14

1/ Recommended rates for broadcast seeding mixes are about 50 – 100 seeds per square foot.

These seed mixes include the recommendations of District and Forest Specialists. We referred to seed mixes previously used on the Forest and the Intermountain Planting Guide, from Utah State University Cooperative Extension Service, while designing these seed mixes to achieve the FSM objectives listed above.

BAER Team / Recommendation

Treatments Proposed

Two seed treatments are proposed. One mix is designed for the lower elevation portions of the fire and one for the upper elevation portions. (see Aerial Seeding Treatment map) The lower elevation mix should be applied to approximately 300 acres. The high elevation mix should be applied to approximately 393 acres.

Most of the seed will be applied in areas that receive about 14 to 30 + inches of precipitation annually. The value of multiple species in the seed mix provides the flexibility for different species in the seed mix to thrive in a microsite that is best suited for that certain species.

There may be opportunities to add other species to the seed mix. The Utah Division of Wildlife Resources (UDWR) has already contacted the district offering to supplement the seed mix with forbs and shrubs. Depending on seed availability and time of seeding, the Division may have seed for forb and browse species that could be added to the seed mix that would enhance both wildlife habitat and diversity in the area.

We constrained the total number of acres to be seeded by several guiding factors:

Only seed in moderate and high / burn severity areas located on NFS lands.

Seed areas where pre-burn vegetation lacked adequate grass seedbank.

The Planting Guide for Utah gives the following information in the “Wildfire Seedings” section. “Steep slopes and rough areas that are not accessible to conventional ground equipment can be aerial seeded, if it is not possible to cover seed, plant late in the fall and increase the seeding rate burned sites, including forest and desert ranges are often seeded within a few days or weeks following the fire, in the mistaken belief that the ash will cover the seed even if an ash residue or a loose seedbed is present, seed only during the appropriate seasons. Does not plant on a loose dry seedbed but plant in the late fall when seedbeds are firm.”

TEMPORARY FENCING FOR TREATMENT PROTECTION

In order to protect the seeding treatment planned for the Lost Lake Fire rehabilitation, the BAER team recommends purchasing 1.5 miles of temporary fencing to protect the site from domestic livestock use. The fence would run between the Del Stot Burn-Out and Coleman Reservoir on the southeast end of the treatment area. The fence would tie into natural barriers essentially creating a livestock enclosure around almost the entire treatment. The fence separates two pastures in the same allotment. The fence would allow permittees to continue use on the unburned pastures of the allotment while protecting the burned area. Comparisons were made between barbed wire and electric fence including materials, installation, and maintenance costs. Both temporary fence options were comparable in overall cost. The barbed wire fence requires less maintenance and is more effective. The electric fence can fail and maintenance costs are 5 times higher.

NOXIOUS WEED EXPANSION MONITORING and SPOT TREATMENT

The Fremont River Ranger District weed crew will implement this strategy in 2012 and 2013 to detect and treat any new infestations of noxious weeds in the burned area. This treatment includes a search for any new individuals of noxious weeds on forest-administered lands along the forest routes used during fire suppression activities. Also spike camp and drop point locations will be monitored. Noxious weeds will be sprayed with herbicide at the same time they are discovered. The search will occur three times during the growing season preferably in May, late-June and early August; about 96 acres. **This area of the Forest is currently Noxious Weed free.** These efforts will help maintain that level of forest health.

STORM PATROLS

Following large storm events or as reports are received about debris flows on roads and trails Forest staff will patrol the area and address the problem. This may involve equipment use to clean plugged culverts, remove and replace failed culverts and grading road surfaces for proper drainage. Additionally, staff will make recommendations for interim BAER funding requests that may be needed.

ROAD AND TRAIL TREATMENTS

(ROAD STABILIZATION)

CULVERTS/DRAINS

Purpose of Treatment: Cleaning culverts will allow flows to pass through and reduce the risk of road damage. One culvert on the Coleman Reservoir road needs to be replaced for road protection. For those culverts that are down drainage from the fire that are located on county maintained roads coordination with the county will occur to insure they are aware of the debris flow potential.

General Description: Cleaning includes the cleanout of catch basin culvert inlets, outlets, and the drop inlets. Replacement of existing culverts with larger culverts is the best solution in cases where existing culverts are too small. On higher traveled roads, culverts provide a cost effective way to maintain traffic flow while also passing the drainage flows.

Location (Suitable) Sites: Culvert cleaning will occur along the Donkey Flat road. Culvert replacement will occur on the Coleman Reservoir road. Culvert cleaning along county roads will be completed by county personnel. The Fishlake will coordinate efforts with the county to share information of the areas of concern.

TRAIL STABILIZATION

Purpose of Treatment: Grade dips, and waterbars will divert water off of the trail preventing erosion and debris flows from degrading the trail. These methods will keep the trail from becoming a stream channel and prevent the loss of the trail.

General Description: Install drainage structures to prevent erosion, mass wasting and mud flows that are predicted to occur following the burn. These measures would reduce the risk to trail infrastructure. (note: the topography of the area calls for a large density of drainage features per mile and the added instability of the soil calls for more drainage features and the remoteness of the area will require more time to access the project area to complete work).

Location (Suitable) Sites: Locate drainage structures along 5 miles trails within the fire perimeter. See Infrastructure Treatments and Safety Measures Map)

PROTECTION AND SAFETY MEASURES

ROAD AND TRAIL / BURNED-AREA WARNING SIGNS

Purpose of Treatment: The purpose of the BURNED-AREA signs is to warn the public of potential hazards resulting from the effects of the fire, such as rolling rocks, falling trees, road washouts, and flash floods.

General Description: This treatment is for the installation of burned-area warning signs. Burned-area signs consist of a warning to the public identifying of the possible dangers associated with a burned-area. It shall contain language listing items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, and flash floods.

Location (Suitable) Sites: These signs shall be installed at all entries into the fire perimeter. The location of these signs shall be along roads and trails that access the burned area (5 signs in total). All signs will be placed facing the direction of travel entering the burn area.

Implementation Monitoring:

Determine if the following proposed treatments were implemented as outlined in the BAER report:

- **Aerial straw application:** Was work performed safely and without injury? Did ground cover meet location and extent? Was application timely? Did the estimated costs approximate budgeted allocations?
- **Broadcast Seeding:** Are the seed mixtures applied to the intended sites with the proper rates of application?
- **Explanatory Signs:** Are the signs installed at the designated locations with the intended messages? Are the signs clear and legible? Was the installation timely? Did costs approximate budgeted allocations?
- **Road and Trail:** Are drainage structures installed correctly? Were culverts cleaned and replaced as planned?

I. Effectiveness Monitoring Narrative:

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

Interim Evaluations

The Implementation Team Leader will conduct periodic evaluations with the District and Forest / Implementation Team to assess implementation progress, effectiveness monitoring and to determine if parameters measured and sampling frequency meet the planned objectives. The BAER team understands that monitoring funds could be available for effectiveness monitoring in years 2 and 3 provided that the Fishlake National Forest submits interim reports to request addition funding and provided that the Forest documents and shares their findings.

Monitoring Reports

The overall results will be presented in a detailed summary report during 2013. This report will be submitted to the Forest Supervisor, District Rangers, the Regional Office and all cooperating agencies and other interested parties.

Annual Financial Requirements

Report cost of monitoring by year.

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

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									
Aerial Mulch-acre	acres	906	300.0	\$271,800	\$0		\$0	\$0	\$271,800
Broadcast Seeding-ac	acres	124	693.0	\$85,932	\$0		\$0	\$0	\$85,932
Weed Treatment-ac	acres	48.54	96.0	\$4,660	\$0		\$0	\$0	\$4,660
Temporary Fence-mi	mile	7800	1.5	\$11,700					\$11,700
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0	\$0
Subtotal Land Treatments				\$374,092	\$0		\$0	\$0	\$374,092
B. Channel Treatments									
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0	\$0
Subtotal Channel Treat.				\$0	\$0		\$0	\$0	\$0
C. Road and Trails									
Trail Drainage-mile	mile	2107	5.0	\$10,535	\$0		\$0	\$0	\$10,535
Road Culverts-each	each	2250	1.0	\$2,250	\$0		\$0	\$0	\$2,250
		0	0.0	\$0			\$0	\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0	\$0
Subtotal Road & Trails				\$12,785	\$0		\$0	\$0	\$12,785
D. Protection/Safety									
Warning Signs	each	500	5.0	\$2,500	\$0		#REF!	#REF!	#REF!
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0	\$0
Subtotal Structures				\$2,500	\$0		#REF!	#REF!	#REF!
E. BAER Evaluation									
Assess. & Report	1	20,000	1	\$20,000			\$0	\$0	\$20,000
<i>Insert new items above this line!</i>				---	\$0		\$0	\$0	\$0
Subtotal Evaluation				\$20,000	\$0		\$0	\$0	\$20,000
F. Monitoring									
monitoring plan	Job	0	0	\$0	\$0		\$0	\$0	\$0
Storm Patrol	Job	2800	1.0	\$2,800					
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0	\$0
Subtotal Monitoring				\$2,800	\$0		\$0	\$0	\$0
G. Totals				\$392,177	\$0		#REF!	#REF!	#REF!
Previously approved				\$323,477					
Total for this request				\$68,700					

PART VII - APPROVALS

1. /s/Diane Freeman for Allen Rowley
Forest Supervisor (signature)

11/16/2012
Date

2. /s/Laurie A. Sonju (for)
Regional Forester (signature)

11/20/12
Date