Date of Report: 09/04/2015

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. REVISED **Initial Request (Best estimate of funds needed to complete eligible stabilization measures)**

[] 2. Interim Report __.
[ ] Updating the initial funding request based on more accurate site data or design analysis
[ ] Status of accomplishments to date

[ ] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Solitude

B. Fire Number: UT-FIF-005153

C. State: Utah

D. County: Sevier

E. Region: 4

F. Forest: Fishlake National Forest

G. District: Fillmore

H. Fire Incident Job Code: P4J0DE (0408)

I. Date Fire Started: July 17, 2015

J. Date Fire Contained: 50% completed

K. Suppression Cost: $1,035,000 as of August 11, 2015; fire is still not contained or controlled.

L. Fire Suppression Damages Repaired with Suppression Funds
1. **Fireline waterbarred (miles)**: 0.1 miles
2. **Fireline seeded (miles):** N/A
3. **Other (identify):**

M. Watershed Number: 160300030502 South Cedar Ridge Canyon (HUC6)

N. Total Acres Burned: 2,175
[2,175] NFS Acres [0 BLM] Other Federal [0] Private

O. Vegetation Types: Mixed Conifer (85 Acres), Mixed Conifer/Mountain Brush (744 Acres), Seral Aspen (327 Acres), Curlleaf Mountain-Mahogany (725 Acres), Oakbrush/Mountain Big Sagebrush

(70 Acres), Oakbrush/Perennial Grasses (56 Acres), Stable PJ (96 Acres), Mountain Big Sagebrush (70 Acres).

P. Dominant Soils: Soils dervied from Flagstaff Limestone geologic type include; map symbol (MS) #120 (55.6 Acres) Brinkert/Hourglass families; MS 143 (69.7 Acres) Duchesne/Genoa families; MS 158 (397.7 Acres) Forsey/Woohurst/Namon families; MS 163 (743.8 Acres) Gridge/Whiteman families; MS 178 (14.5 Acres) Namon/Forsey families; MS 181 (70.4 Acres) Pernty\Agassiz families; MS 186 (96.4 Acres) Ranruff/Promo families; MS 215 (725.2 Acres) Woodhurst/Forsey families.

Q. Geologic Types: Flagstaff Limestone (2159 Acres), North Horn Formation (16 Acres).

R. Miles of Stream Channels by Order or Class: 1st order-5.4 miles; 2nd order-1.9 miles; 3rd order-1.0 miles

S. Transportation System

Trails: 1.84 total (1.5 motorized, 0.34 non-motorized) **miles** **Roads:** 1.9 **miles**

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 846 (40%) (**very Low/ unburned**) 600 (27%) **(low)** 563 (26%) **(moderate)** 166 (7%) **(high)**

B. Water-Repellent Soil (acres): 672

C. Soil Erosion Hazard Rating (acres): 1,392 **(low)** 781 **(moderate)** 0 **(high)**

D. Erosion Potential: 4.0 tons/acre

E. Sediment Potential: 1,900 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):	5
D. Design Storm Duration, (hours):	0.5
E. Design Storm Magnitude, (inches):	0.78
F. Design Flow, (cubic feet / second/ square mile):	18.0
G. Estimated Reduction in Infiltration, (percent):	40
H. Adjusted Design Flow, (cfs per square mile):	28.2

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

SOLITUDE WILDFIRE

BAER / CRITICAL VALUES-AT-RISK SUMMARY TABLE

Much of the burned-area is currently prone to very high flooding hazards; specifically in the Newt's Canyon drainage. Newt's Canyon is a tributary to South Cedar Ridge Canyon which flows east to Interstate 70 and to the towns of Sigurd and Vermillion. The values at risk shown below were asssessed based upon the post fire conditions and likelihood of post fire events. The BAER critical values are;

- Human life and safety
- Private primary residence
- Forest, private, state, and interstate road infrastructure
- Agricultural water, land, improvements and products (i.e. alfalfa, corn, dairy, and turkey farms)
- Diversion and canal system
- Forest trail infrastructure
- Soil productivity
- Hydrologic function

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 and human safety. The magnitude of consequences to soil productivityis major. Overall, the assessed risk is very high for soil prodictivity and high for human life and safety, property, and culinary/agricultural water sources.

HUMAN LIFE AND SAFETY

Human Life and Safety on NFS lands.

Users of FS Transportation System (Roads) – There are likely flooding hazards to the Newt's Canyon Road which is used by the public for dispersed recreation, wood gathering, hunting, and range management activities. – Possible Probability of Damage or Loss / Major Consequences… **HIGH 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**

Human Life and Safety on lands other than NFS.

Users downstream – Flooding to private, interstate, state, and county transportation surfaces (i.e. I-70 and Hwy 118), occupied structures, agricultural lands, and overall safety of the general public at the mouth of South Cedar Ridge Canyon. –Likely Probability of Damage or Loss/ Moderate Consequences… **HIGH RISK**

PROPERTY

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

Forest Roads – Likely Probability of Damage or Loss / Minor Consequences… **LOW RISK**

There are approximately 3.75 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. The Newts Canyon road FR389 will experience runoff and down cutting will occur in the high and moderately burn severity sections totaling 1.25 miles. 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**
1.1 miles of trails (1.5 miles motorized and 0.34 miles non-motorized) are within the burn perimeter. 1.1 miles of the motorized trail is at risk from debris flows and accelerated erosion rates associated with rain events. Hydrophobic soils will add to the severity of the erosion rates. Trail segments selected for treatment are those that are directly downslope from high and moderate burn severity areas. It is anticipated that sections of the trails will be lost where hillslopes and drainages that burned at high or moderate intensities, intersect with it resulting in a hazardous and impassible trail system. Effects to trail surfaces from erosion will remain for 2 to 4 years until soils stabilize.

Property at Risk off NFS Lands

Roads downstream from NFS lands - Likely Probability of Damage or Loss / Moderate Consequences… **HIGH RISK**
The Solitude fire burned in the headwaters of Newts Canyon, a tributary to South Cedar Ridge Canyon, which flows to the east where it empties onto an alluvial fan upslope from Interstate 70 and the towns of Sigurd and Vermillion. South Cedar Ridge Canyon has produced floods within the past 5 years that delivered debris across the interstate, on to agricultural lands, and across State Route 118. This flow pattern occurred without a fire in the drainage. Various unpaved county and private roads are intersected by the flow path from South Cedar Ridge Canyon.

Structures on Private Lands near NFS burned lands - Possible Probability of Damage or Loss / Moderate Consequences … **INTERMEDIATE RISK**
Primary residences, agricultural outbuildings, a $3,000,000 milk barn, a power substation which is a key link to the main power grid in the western US, and an auto salvage business are located below the alluvial fan in South Cedar Canyon which is at risk to possible flooding following precipitation events. Moderate and High severity burn zones in the headwaters of Newts Canyon will accelerate sediment and debris flow.

Significant Investments near NFS burned lands – Possible Probability of Damage or Loss / Moderate Consequences… **INTERMEDIATE RISK**
Agricultural improvements such as, cultivated fields with pivots, turkey raising facilities, and feed storage areas for alfalfa and corn silage could be impacted by flood water and debris flow following a precipitation event in Newts Canyon. Over $2,000,000 of livestock feed is stored along Highway 118 between Sigurd and Vermillion.

Agricultural Water System - Likely Probability of Damage or Loss / Minor Consequences … **LOW RISK**
A series of ditches and canals and a diversion structure are in place for irrigation purposes. It is possible for debris to fill in and damage sections of the canals and ditches post storm event.

NATURAL RESOURCES

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 34% of this incident was subjected to Moderate and High Severity Burns. Approximately 166 acres were mapped as high burn severity and 563 acres burned at moderate severity. The lack of ground cover and hydrophobic soils will likely increase surface runoff, flooding, and erosion during typical summer monsoon rain events.

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 contiguous areas burned at moderate and high severity. Fire severity mapping imagery indicated that the most of the burn occurs within Newts Canyon with four tributaries being burned by the fire. Newts Canyon had nearly all the moderate and high severity acres (~700 acres) on this fire. Hydrophobic soils are found up to 3 inches in depth in the moderate and high severity fire locations and increased flows are expected. Flooding and excess sediment can be expected throughout the affected drainages with subsequent movement of large amounts of sediment and water in the lower canyon during climatic events. According to ERMIT model runs, 4 tons per acre of sediment delivery is possible during the first year following the fire.

Native or naturalized communities on NFS land where invasive species or noxious weeds are absent or present in only minor amounts. Very Likely Probability of Damage or Loss / Moderate Consequences …**VERY HIGH RISK**

The naturalized plant community that existed prior to the fire contained a mix of native and non-native grass species. The team observed in the unburned areas, Indian Rice Grass, squirrel tail, slender wheat grass, needle-and-thread grass, blue-bunch wheat grass, and Columbia needle grass. Non-natives include timothy, smooth brome, Kentucky bluegrass and alfalfa. The Fir, Ponderosa pine, juniper, and mahogany dominated areas of the fire had a minimal herbaceous understory. Opportunities for reseeding from existing populations of grasses and forbs are limited in these areas which were also the areas that burned at high and moderate intensities. The majority of the fire area is currently **noxious weed free**. However, Leafy spurge, field bindweed, and whitetop are directly adjacent to fire. A known population of musk thistle is located along the road in Newts Canyon. The aggressive nature of the invasive species adds to the high potential to spread further into the fire area especially where pre-burn vegetation understory was limited. Also, it is possible that equipment used during suppression activities transported noxious and/or invasive weed species into the area. Areas that were prepped for contingency lines, roads, parking areas, drop points and spike camps are areas of primary concern for introduction. The adjacent populations of noxious weeds have a high potential to spread further into the fire area.

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**

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

Land	65 **%**	**Channel**	**NA**	**Roads / Trails**	**85 %**	**Protection / Safety**	**90 %**

D. Probability of Treatment Success: (on NFS lands)

Treatment Types:	← **Years After Treatment** →		
	1	**3**	**5**
Land Treatments (seeding)	**60 %**	**70 %**	**75 %**
Channel Treatments (None)	**NA**	**NA**	**NA**
Road / Trail Treatments (drainage)	**85 %**	**85 %**	**85 %**
Protection / Safety Treatments (signs)	**90 %**	**90 %**	**90 %**

E. The Cost of Taking No - Action: $179,800

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 (Dozer and Excavator equipment and operator time to re-grade road surfaces + fill material + replacement costs	$44,800
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)	$11,000
Potential damage or loss of soil productivity and hydrologic function from sedimentation and erosion following climatic events will result in; Non-market ecological value loss of seedbank and aspen root structure affecting revegitation potential. Market values, direct and loss-of-use, affected by a loss of soil productivity and hydrologic function include: Loss of big game and upland game habitat and road and trail infrastructure.	$96,800
Introductions of noxious weeds to native or naturalized plant communities on NFS lands used during suppression efforts (personnel costs (2 GS-3 seasonals) + equipment + chemicals for detection and treatment x number of treatments needed	$ 69,000
Total	$ 179,800

F. The Cost of the Selected Alternative: $ 137,309.50 (including loss)

Values-At-Risk	Estimated Costs
Potential damage to NFS roads. Seeding treatments are estimated to be 60% effective in reducing frequency of runoff and slowing erosinal processes for 1-2 year storm events. (Cost of road treatments + 40% failure rate of road treatments + storm patrol + % 15 of cost of seed)	$15,754.75
Potential damage to NFS trails. Seeding treatments are estimated to be 60% effective in reducing frequency of runoff and slowing erosinal processes for 1-2 year storm events. (40% failure rate of $5,500 + cost of trail stabilization treatments + %15 of cost of seed)	$16,454.75
Potential damage or loss of soil productivity and hydrologic function from erosion following climatic events. Seeding treatments are estimated to be 60% effective in reducing frequency of runoff and slowing erosinal processes for 1-2 year storm events. (Cost of seeding + 40% failure rate and subsequent loss of market value of soil and hydro $55,00)	$80,365
Introductions of noxious weeds to native or naturalized plant communities on NFS lands used during suppression efforts.	$24,735
Total	$137,309.50

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology	**[X] Soils**	**[X] Geology**	**[X] Range**
[ ] Forestry	**[ ] Wildlife**	**[ ] Fire Mgmt.**	**[X] Engineering**
[ ] Contracting	**[ ] Ecology**	**[X] Botany**	**[X] Archaeology**
[ ] Fisheries	**[ ] Research**	**[ ] Landscape Arch**	**[X] GIS**
[X] Recreation	**[ ] 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 qualifiying treatments for the appropriate funding authorities. For seeding treatments include species, application rates and species selection rationale.

LAND TREATMENTS

Broadcast Seeding

Findings
After doing the initial size up of the burned area, spending time in the field, developing the burn severity map and reviewing other resource information from the District Office, and the supervisors office, two main risks were identified that broadcast seeding would be an appropriate response action for emergency stabilization

Risk 1- Threat of expanding infestations of noxious weeds:
The central portion of the Pahvant range is prone to rapid invasion and/or expansion of the abundant populations of noxious weeds in and around the Solitude burn scar. Because of inherent dry conditions and proximity to existing populations of noxious weeds the entire burn area is prone to infestation. It was observed that another fire from 2009 (Amos Fire), that is just 10 miles north of the Solitude fire, experienced a large influx of non-desirable species. That fire had no post burn treatment. For these reasons, we propose a seeding of 25 lbs. per acre with native grass and sterile cereal grain species that are intended to supplement the post fire response of the existing plant species and compete well with noxious weeds. This seeding should counter the potential establishment, and spread of noxious weeds. The burned area is essentially free of noxious weeds; however, the area is on the receiving edge of noxious weeds coming in from all directions. Forest service lands have only a few occurrences of the noxious weeds in the vicinity. The burn area will require use of an early detection/rapid response strategy with the noxious weed program for several years.

Risk 2 – Soil Erosion and loss: Utilization of sterile cereal grains and perennial grasses will stabilize hillslopes and augment revegetation where seed sources are limited due to the pre-burn conditions of a limited understory. The district has experienced success with stabilizing hillslopes with past seeding treatments i.e. Sawmill and Clay Springs fires with perennial grass seed mixes.

The objective of seeding perennial grasses and sterile cereal grains is to stabilize hillslopes and reduce the expansion of noxious weeds into the burned area.

The objectives of, stabilizing the hillslopes and reducing expansion of noxious weeds, remains the same. The District in partnership with the Utah Division of Wildlife Resources and with input from the Forest botanist developed a seedmix to meet these objectives.

Monitoring data from past BAER seeding treatments on the district, both qualitative and quantitative, supports the recommendation of seeding as an effective year 1 treatment for soil stabilization and noxious weed prevention.(Appendix A)

- Year 1 results on the Sawmill BAER reseeding. Seeded in April of 2010, first reading in June of 2010 – 31% ground cover. Second reading July of 2010 – 53% ground cover. In 2011 the plots recorded 65% ground cover all from an increase in vegetation and litter (Tait 2015)
- Year 1 results on the Clay Springs BAER reseeding. Seeded in the fall of 2013 with native and non-native grasses. Qualitative estimates of 50-70% ground cover observed (see photos appendix A). Pre-burn photos in appendix A also show the seeding effectiveness for out competing weedy species.

Proposed Treatments
Aerially broadcast seed in late fall just before, or after the first snow. Excellent results have been observed when seed is applied to a thin layer of snow. Rest the seeded area from livestock grazing for two growing seasons. This will give the seeded species and residual plants two seasons to grow, set seed and begin to re-establish.

The recommended seed mix is "of species known to be effective for erosion control, adapted to the target area and compatible with future management objectives. (FSH 2509.13,20 p. 13) The seed mix contains a native species and sterile cereal grains to help restore ecosystem function by reducing erosion with the early germinating cereal grains and protecting against the invasion of noxious weeds through the establishment of native grasses.

The seed purchased will be certified to the variety claimed. Also the mix will be certified that No noxious weed seeds are present. Actual costs may vary depending on availability at time of purchase from successful bidder.

The following table shows the pounds per acre that is used in the seed mix.
The Utah Division of Wildlife Resources will provide the majority of the seed in the proposed seed mix. This interim request (Solitude Interim Request #1) is for triticale and slender wheatgrass and the cost of aerial application.

	Application-lbs./acre	Total lbs.	Cost $/lbs. Estimate	Total Cost
Blue bunch wheatgrass (UDWR)	.5	325	$0	$0
Slender Wheatgrass	2	1300	$2.50	$3,250
Triticale	3	1950	$.32	$640
Mountain brome (UDWR)	6	3900	$0	$0
Canby blue grass (UDWR)	.5	325	$0	$0
Sandberg bluegrass (UDWR)	.5	325	$0	$0
Thick spike wheat grass (UDWR)	1	650	$0	$0
Timothy (UDWR)	.5	325	$0	$0
Orchard Grass “Potomac” (UDWR)	2	1300	$0	$0
Sandpoint (UDWR)	.5	325	$0	$0
Small Burnet (UDWR)	.5	325	$0	$0
Alfalfa “Ladak”	2			
	Total lbs./acre 19			$3,890

Due to the topography and elevation (7,500 ft to 8,500 ft) of fire area, and the treatment polygons it is recommended that rotor-wing aircraft be utilized for seed application. Estimate to apply 19 lbs of seed/acre on 650 acres is $25,000. Estimate is based similar projects i.e. Levan Fire BAER, and quotes from vendors. The amount of $25,000 includes buying triticale and slender wheatgrass, transporting seed to the Great Basin Research Center for mixing and delivery of mixed seed to staging area and the flight time for application.

This seed mix includes 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.

The seeding is being pursued as a partnership project with the state of UT. Opportunities to utilize available seed from the state seed warehouse in Ephraim as well as other sources is being considered.

Most of the seed will be applied in areas that receive about 14-20 inches of annual precipitation. Some of the species in the mix have the ability to dominate a stand depending on the location. 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.
Specific ecological attributes for some of the species include the following:

Slender Wheatgrass - "valuable in erosion control because of its rapid development"
Mountain Brome- "will establish and grow on rather poor, depleted soils… recommended sites include weedy openings"

Canby and Sandberg bluegrass - "important for soil stabilization… one of the first grasses to green up in the spring…excellent in low rainfall native mixes"
Thick spike wheatgrass - "adapted to disturbed range sites and dry areas subject to erosion"

There may be opportunities to add other species to the seed mix. We suggest that the District personnel contact the Utah Division of Wildlife Resources prior to actual purchase of the seed. 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.

The planting guide for Utah gives the following information in the Wildfire Seeding "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 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 ash will cover the seed… even if an ash residue or a loose seedbed is present, seed only during the appropriate seasons. Do not plant on a loose dry seedbed… plant in the late fall when seedbeds are firm.

Seeding will be aerially broadcast without any additional ground treatment. The seed will be flown on in the fall just before snowfall. The estimate for fixed wing is $ 12 - $13 per acre and $50-60 per acre for application utilizing rotor wing aircraft.

Aerial Seeding Monitoring
Implementation monitoring of the seeding application will include inspections of the seed distribution by known area markers on the ground to verify adequate seed density/sq. ft.
Adequate Spring moisture will be key to the success of the aerial seeding treatment. It will be important to monitor the establishment of seeded species during the 2016 growing season.

NOXIOUS WEED EXPANSION MONITORING and SPOT TREATMENT

The Fillmore Ranger District weed crew will implement this strategy in 2016 and 2017 to detect and treat any new infestations of noxious weeds in the burned area. Two aggressive weeds need immediate attention: Leafy Spurge, and Musk Thistle, four other noxious weed species, Canada thistle, field

bindweed, hounds tongue and whitetop, were observed in or nearby the Solitude burn area. The recently burned area is a prime disturbed site for noxious weeds to occupy.
The treatment provides for a weed crew to monitor the 600 ft. wide buffer around known locations of noxious weeds adjacent to the burned area on the forest lands and to detect and treat new occurrences of noxious weeds that may be spreading from known these locations. The weed monitoring and spot treatment will also focus on areas where equipment was used during suppression efforts. A control line in the form of a shaded fuel break was constructed along Forest Road 096 from Mill Canyon to ICP at Willow Creek and continued on to the ridge in Red Canyon. 100 feet on either side of this line will be checked for noxious weeds that may have been transported on suppression equipment..

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

Rolling Dips and Culvert Cleaning

Purpose of Treatment: Installing rolling dips on Forest Road 389 through the burn area that will be influenced by overland flows associated with water repellant soils in the high and moderate burn severity areas for a total of 1.25 miles (see Routes Adjacent to High and Moderate Burn Severity Map). This will minimize damage to the road and maintain access to the canyon.

Cleaning culverts will allow flows to pass through and reduce the risk of road damage. All culverts are down drainage from the fire on state and county maintained roads. Coordination with the appropriate agency will occur to insure they are aware of the debris flow potential.

General Description: Installing rolling dips that are armored with native matierals will prevent headcutting from the fill side of the road. The dips will need to be created where natural drainages intersect with the road base.
Cleaning culverts 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. Any decisions to replace culverts will be the responsibility of the road manager. There are no culverts on NFS lands within the fire perimeter.

Location (Suitable) Sites: Rolling dips will be installed where slope drainages cross the road in the high and moderate burn severity zones of the fire (see Routes Adjacent to High and Moderate Burn Severity Map).
Culvert cleaning will occur along private, county, and state roads below the fire at the mouth of South Cedar Ridge Canyon. Culvert cleaning along county and state roads will be completed by county and or state personnel. The Fishlake will coordinate efforts with the county to share information of the areas of concern.

TRAIL STABILIZATION

Grade Dips and Waterbars

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 1.1 miles trail within the fire perimeter that are adjacent to or will be influenced by overland flows off of water repellant soils in the high and moderate burn severity areas (see Routes Adjacent to High and Moderate Burn Severity 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 (6 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:

- **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 are grade dips and water bars functioning properly?

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.

Effectiveness of Seeding to Limit Invation of Noxious Plants Into The Burn Area

A separate monitoring request will be submitted for Level 2 monitoring of BAER treatment effectiveness. The monitoring will focus on the effectiveness of emergency seeding to prevent noxious weeds from becoming established within the burn area. The monitoring will include a threshold value for determining effectiveness such as the treatment was effective if there is a 25% reduction in cover of noxious plants compared to the non-treated sites.
Level 2 effectiveness monitoring will be implemented for 3 years post seeding to analyze seeding effectiveness in preventing or limiting the expansion of noxious weeds in the burned area. The forest botanist has established study plots in seeded and unseeded burned areas (see attached map). Sites selected are similar in terrain, aspect, elevation, and soil types. $5,000 for monitoring in year one is part of this request. Total for seeding ($25,000) and monitoring ($5,000) = $30,000.

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 additional 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 2016. 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 #**

			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										
Broadcast Seeding-ac	acres	38	650	$24,999	$0		$0		$0	$24,999
Weed Treatment-ac	acres	4.71	1,455	$6,853	$0		$0		$0	$6,853
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$31,852	$0		$0		$0	$31,852
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										
Trail Drainage-mile	mile	4993	1.1	$5,492	$0		$0		$0	$5,492
Road Drainage - mile	mile	2400	1.25	$3,000	$0		$0		$0	$3,000
Warning Signs	each	320	6	$1,920	$0		$0		$0	$1,920
		0	0	$0			$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$10,412	$0		$0		$0	$10,412
D. Protection/Safety										
	0	0	0	$0	$0		$0		$0	$0
Storm Patrol	Job	2800	1	$2,800	$0		$0		$0	$2,800
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$2,800	$0		$0		$0	$2,800
E. BAER Evaluation										
Asess. & Report	1	15,000	1	$15,000			$0		$0	$15,000
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$15,000	$0		$0		$0	$15,000
F. Monitoring										
monitoring plan	Job	5,001	1	$5,001	$0		$0		$0	$5,001
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$5,001	$0		$0		$0	$5,001
G. Totals				$50,065	$0		**$0**		**$0**	**$50,065**
Previously approved				$20,065						
Total for this request				**$30,000**						

PART VII - APPROVALS

1. /s/ Mel Bolling 09/04/2015
   Forest Supervisor (signature) Date

2. /s/ Mark Bethke (for) 09/15/2015

Regional Forester (signature) Date