

BURNED-AREA REPORT
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST****A. Type of Report**

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

B. Type of Action

- ☐ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
☒ 2. Interim Report (Interim #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:** Beaver Creek**B. Fire Number:** ID-TFD000337**C. State:** Idaho**D. County:** Blaine & Camas**E. Region:** 04 - Intermountain**F. Forest:** 14-Sawtooth**G. District:** Ketchum & Fairfield**H. Fire Incident Job Code:** PDHT80**I. Date Fire Started:** August 7, 2013**J. Date Fire Contained:** September 1, 2013**K. Suppression Cost:** \$26,022,181 (estimated from ICS209, September 7, 2013)**L. Fire Suppression Damages Repaired with Suppression Funds (NFS lands only)**

1. Fireline water barred (miles): 66 miles
2. Fireline seeded (miles): 62 miles
3. Other (identify):

M. Watershed Number:

Sub watershed (Hydrologic Unit)		
6th Code Number	6th Code Name	Percent of Watershed Burned*
170402190104	Baker Creek	34%
170402190201	Placer Creek-Warm Springs Creek	50%
170402190202	Castle Creek-Warm Springs	56%

	Creek	
170402190203	Rock Creek-Warm Springs Creek	43%
170402190501	Greenhorn Creek	41%
170402190502	Deer Creek	69%
170402190503	Croy Creek	25%
170402190505	Indian Creek-Big Wood River	8%
170402200401	Upper Willow Creek	64%
170402200402	Middle Willow Creek	12%
170501130103	Big Peak Creek	2%

*Acres within Sub watersheds having very low or unburned severity are not included in the percent of watershed burned calculation.

N. Total Acres Burned:

NFS (93,132) BLM (8,908) State (1,362) Private (12,693)

O. Vegetation Types: Elevations within the burned area perimeter range from 5,358' to 9,650'. Primary vegetation types include Douglas-fir and subalpine fir conifer forests and mountain big sagebrush communities. Primary conifer species include Douglas-fir, lodgepole pine, subalpine fir and whitebark pine. Aspen also occurs throughout most forest types. Brush and grass areas primarily consist of mountain big and low sagebrush, bitterbrush, and a variety of grasses (Idaho fescue, bluebunch wheatgrass).

P. Dominant Soils: The dominant soils are derived primarily from the Sawtooth batholith and Wood River sedimentary formations. Soils that have developed from the extruded Batholith are weathered and fractured with sandy loam textures. These are well-drained, non-cohesive soils generally exhibiting little horizon development, moderate to low fertility, and inherent moderate to high erosion hazard. Cool, moist, moderately deep sandy loam soils occupy north and east aspects and support forest vegetation. Batholith soils on south-facing slopes are typically, single-grain, coarse sandy soils that are mostly dry and sparsely vegetated. The surface soils of forested settings over the sandstone soils are more developed sandy loam or loamy soils with high rock content and are moderately erodible. Soils on north facing slopes are mostly skeletal having high quantities of larger gravel/small cobble rock on the surface and through the soil profile. Soils on south facing slopes have similar amounts of rock which are more gravel-sized. Soils within the valley bottoms have developed over the Quaternary Glacial Alluvial Deposits consist of more developed sandy loam or loamy soils with high coarse rock contents. Most all the soils have moderate to high infiltration and permeability rates. The primary factor limiting vegetation production is the lack of moisture available during the growing season.

Q. Geologic Types: The Beaver Creek fire burn area is underlain by Paleozoic marine sediments of the Wood River Group, Cretaceous granite plutonic rock of the Idaho Batholith, and plutonic and volcanic rock associated with the Eocene Challis Volcanics (Figure 1). Occurrences of granite and volcanic rocks tend to be highly fractured in outcrop and decompose into lighter colored colluvium and decomposed granite (DG) soils that are locally thick and gullied, and prone to rapid erosion and slope instability without stabilizing surface vegetation. The Paleozoic formations also tend to be highly fractured in outcrop and may locally form talus or scree slopes. Debris avalanches are common in all lithologies and dangerous on slopes at upper elevations and in narrow tributary valleys. Surficial deposits in general are mainly the result of active slope processes, including landslides, that tend to thicken toward the valley fill, and active river-channel processes that redistribute gravel and sand.

R. Miles of Stream Channels by Order or Class:

Perennial: 256 Intermittent: 136

S. Transportation System (miles)

Roads: 64 Trails: 118

PART III - WATERSHED CONDITION

A. Burn Severity (acres)

	USFS		BLM		State		Private	
Class	Acres	Per cent	Acres	Per cent	Acres	Per cent	Acres	Per cent
Very Low	28,194	30%	1,972	22%	180	13%	2,677	21%
Low	13,437	14%	1,324	15%	183	13%	1,968	16%
Moderate	43,325	47%	5,104	57%	910	67%	7,380	58%
High	8,175	9%	508	6%	88	6%	668	5%

Fire intensity and soil burn severity are often incorrectly used synonymously. Fire intensity refers to the above ground fire effects generally identified through visual observations of changes in vegetation. Soil burn severity is the effect of fire at and below the ground surface, specifically how the fire changes the physical and chemical composition of the soils. While fire intensity is not the primary indicator of wildfire effects on soils, observed changes from pre- to post-fire vegetation are used to interpret soil burn severity and to inform watershed response. Soil burn severity that detrimentally impacts soil conditions leads to further degradation of soil productivity and soil-hydrologic function.

As illustrated on the burn severity map, the overall soil burn severity pattern is mosaic and patchy. However, large contiguous areas of moderate and high burn severity exist throughout the burned area. Moderate soil burn severity is generally associated with consumption of sagebrush/bitterbrush. Where high burn severity occurs, it is generally associated with consumption of relatively dense forested stands.

B. Water-Repellent Soil (acres): 17,162

C. Soil Erosion Hazard Rating (acres):

2,064 acres (low) 82,603 (moderate) 8,465 acres (high)

D. Erosion Potential: tons/acre

Forested Soil Erosion Potential = average of 6.4 tons/acre (range from 4.1 to 11.5)

Non-forested Soil Erosion Potential = average of 8.2 tons/acre (range from 3.7 to 16.4)

E. Sediment Potential: cubic yards/square mile.

ERMiT estimates for erosion potential in tons per acre were converted to cubic yards per square mile. The first-year post-fire average sediment potential for forested lands is 2,485 cubic yards per square mile. On non-forested lands, it is 3,168 cubic yards per square mile.

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period (years): 4-5
- B. Design Chance of Success (percent): 85
- C. Equivalent Design Recurrence Interval (years): 10
- D. Design Storm Duration (hours): 1
- E. Design Storm Magnitude (inches): 0.74
- F. Design Flow (cubic feet / second/ square mile): see table
- G. Estimated Reduction in Infiltration (percent): 19%
- H. Adjusted Design Flow (cfs per square mile):

Sub watersheds in the Beaver Creek Burned Area

Sub watershed (HUC6#)	Sub watershed Name (HUC6 Name)	Total Acres	Acres in Fire Perimeter	% in Fire Perimeter
170402190104	Baker Creek	25992	11079	42.6%
170402190107	Boulder Creek-Big Wood River	17108	0.01	0.0%
170402190201	Placer Creek-Warm Springs Creek	17396	15356	88.3%
170402190202	Castle Creek-Warm Springs Creek	11142	9218	82.7%
170402190203	Rock Creek-Warm Springs Creek	12889	7675	59.6%
170402190204	Red Warrior Creek-Warm Springs Creek	20689	79	0.4%
170402190301	Eagle Creek-Big Wood River	12830	64	0.5%
170402190302	Lake Creek-Big Wood River	17614	290	1.6%
170402190305	Elkhorn Gulch-Big Wood River	27893	189	0.7%
170402190501	Greenhorn Creek	14506	5715	39.4%
170402190502	Deer Creek	37576	34799	92.6%
170402190503	Croy Creek	23743	6603	27.8%
170402190505	Indian Creek-Big Wood River	18797	1792	9.5%
170402200401	Upper Willow Creek	20561	16374	79.6%
170402200402	Middle Willow Creek	10320	1317	12.8%
170402200503	Camp Creek	17146	16	0.1%
170501130103	Big Peak Creek	14486	434	3.0%
170501130201	Headwaters Little Smoky Creek	17456	118	0.7%
170501130202	Upper Little Smoky Creek	14826	40	0.3%

To refine estimates of watershed response, twenty one drainages within the fire perimeter were selected for analysis (Table 4 and Figure 3). These pour points were selected based on locations relative to downslope values, locations of known runoff events based on the storms on Sept 2nd, 3rd, and 5th, and on location below areas of high and moderate burn severity where increased runoff is most likely.

Estimates of storm runoff for 2 and 10 year rainfall events

Catchment Name	Drainage Area (sq. mile)	% of Catchment Burned	Design storm (2 yr. 1 hr.) 0.51"		Design storm (10 yr. 1 hr.) 0.74"	
			Pre-Fire CFS	Post-Fire CFS	Pre-Fire CFS	Post-Fire CFS
Badger Gulch	1.2	100.0	0**	24.1	0	84.9
Baker Creek*	23.3	54.3	0	72.2	0	297
Cherry Creek	6.3	99.2	0	54.8	0	253
Cow Tail Gulch	0.35	100.0	0	12.0	0	41.3
Animal Shelter	0.14	99.8	0	1.7	0	6.8
Democrat Gulch	6.2	99.7	0	49.5	0	201
Deer Creek*	56.4	92.9	0	142	0	578
Wolftone Creek	6.3	52.5	0	13.1	0	54.8
East Fork Baker Creek	7.32	69.3	0	42.5	0	178
Greenhorn Canyon*	22.3	48.8	0	86.1	0	314
Greenhorn Chute	0.05	99.7	0	3.0	0	11.8
Greenhorn Chute North	0.13	100.0	0	2.2	0	8.8
Imperial Gulch	1.6	100.0	0	40.6	0	135
Kinsey Creek	3.8	83.6	0	51.9	0	186
Lambs Gulch	1.9	100.0	0	22.1	0	88.3
Thompson Creek*	11.0	99.7	0	130	0	498
Upper Warm Springs*	44.5	88.9	0	334	0	1290
Warm Springs - Parker Gulch	2.7	99.6	0	31.8	0	123
Willow Creek Trailhead	1.0	100.0	0	14.4	0	51.0
Willow Creek*	33.6	78.4	0	366	0	1401
Buttercup Creek	3.9	100.0	0	58.7	0	220

**Wildcat5 output is for storm runoff only; it does not include base flow. Pre fire estimates of 0 do not necessarily mean a stream would be dry, simply that there would be no runoff from that storm

PART V - SUMMARY OF ANALYSIS

Background: The Beaver Creek Wildland Fire was a reported lightning-caused ignition on August 7, 2013 in rangeland type fuels on Bureau of Land Management land. The fire was originally complexed with the McCan fire but it quickly became evident that the complex could not be effectively managed due to the complexity of the two fires. As the fire made a significant move on to national forest system lands, it was decided to turn the fire over to the Sawtooth NF. Weather conditions during the early stages of the fire, coupled with limited resources due to competition both geographically and nationally set the stage for large fire growth, with towering columns and large acreage growth. The fire grew from 4,786 acres on August 8th to over 16,900 acres on August 9th. Hot, dry weather conditions continued over the next week and a half pushing the fire to well over 100,000 acres, potentially threatening the communities of Hailey and Ketchum, Idaho. Approximately 8,000 residents were in pre-evacuation or evacuated for several days due to predicted rapid fire growth. One residence was lost. The highest percentage of burned area was on NFS lands within Camas and Blaine Counties (93,132 acres). The majority of the fire burned at a moderate burn severity with localized areas of high burn severity. The fire was declared contained on September 1st, 2013. The majority of the burned area (79,114 acres) is on the Ketchum Ranger District with 16,207 acres burned on the Fairfield Ranger District. Approximately 8,903 acres of Shoshone Field Office-BLM, 1,362 acres of State of Idaho land and 12,693 acres of private land were burned.

A. Describe Critical Values/Resources and Threats (narrative):

A comprehensive list of potential values at risk within or directly downstream of the Beaver Creek Burned Area was compiled from multiple sources:

- A Sawtooth National Forest personnel meeting (conducted August 30th)
- An inter-agency meeting with representatives from Blaine County, BLM and the Idaho Department of Lands
- Field review of the burned area and multiple BAER team meetings

Following guidance in Interim Directive 2520-2013-1, the BAER assessment team evaluated potential values through field assessment and subsequent analysis to identify the critical values (FSM 2523.1 – Exhibit 01) that may be treated under the BAER program. The critical values were assigned a level of risk defined by the probability of damage or loss coupled with the magnitude of consequences using the risk assessment matrix (FSM 2523.1 – Exhibit 02). Critical values with unacceptable risks signify a burned-area emergency exists. The probability of damage or loss is based on the watershed response analysis completed by the BAER Assessment Team.

Critical values having a “Very High” or “High” risk rating include a treatment identification number(s) that corresponds to recommended emergency stabilization actions known to mitigate potential threats or minimize expected damage, which are described in Section H. No treatments were identified for values when the analysis resulted in an “Intermediate” or lower risk rating.

Post Fire Watershed Response

Based on soil burn severity, runoff estimates, sub watershed topography, evidence from storms during the week of September 2nd, and downstream values, the primary areas of concern for watershed response are:

- Badger Gulch and Alden Gulch
- Numerous headwater tributaries in Deer Creek drainage (Kinsey Creek, Curran Gulch North Fork, unnamed chutes on south side of Deer Creek between Wolfstone and Kinsey)
- Greenhorn Creek, primarily the steep north facing drainages below Imperial Gulch.
- Headwaters of Willow Creek

A large thunderstorm system on September 2 produced around $\frac{3}{4}$ " of rainfall over much of the burned area within 1-1 $\frac{1}{2}$ hours. Numerous debris/mud flows and flooding occurred in drainages, steep hill-slopes and stream floodplains across the fire area. This storm demonstrated the potential response of the burned area to intense rainfall. Subsequent storms occurred on September 3rd, and 5th resulted in more debris flows and overland flooding. After these storms, large debris flows blocked road access into and out of most canyon areas in the burn perimeter. Impacts to a variety of values at risk, including roads, bridges, trails, homes and fish habitat, were impacted by flood, scour or deposition. While no injuries were reported, these storms and associated flooding and debris flows posed a serious threat to safety at many locations in and adjacent to the burned area. This information was useful in validating and adjusting estimates of expected post fire runoff and precipitation amounts.

Debris flows generally do not move large material (cobble, boulders) beyond the toe of steep tributary drainages. Where steep tributaries (gradient of 10-15 %+) meet main stem receiving streams (~5% gradient), large, coarse debris flow material is deposited. While the coarse material stops, water, floatable debris, and significant amounts of gravel, sand, and silt do not. Beyond the hill-slope toe, the threat from these events is primarily related to rapidly increased stream flows, floatable debris, and increased fine grained sediments in main stem channels downstream (Deer Creek, Warm Springs Creek, Baker Creek, Big Wood River).

Additional threats exist where channel blockage or debris accumulation can act as a dam and flood and backwater sites that would normally not be affected. Flow levels from short duration, high intensity storms generally will return to lower levels in a matter of hours. However, the increased sediment loads produce turbidity that last for several days and can result in sediment deposits in main stem channels that will be reworked in subsequent high flows. While much of the sediment load is suspended and passes through the system, some sediment settles in low velocity channel edges. Large sediment deposits (silt bars) were observed along stream banks and back water sites along Baker Creek, Warm Springs Creek, and the Big Wood River following the recent events. That material will likely remain in place until spring runoff has the energy to redistribute that material. Even in the event that spring runoff is normal and no intense rainfall sends additional sediment downstream, the sediment currently in place would likely create turbidity next spring.

The additional input of sediment and nutrients to the Big Wood River system is important with regards to state water quality standards and the compounding effect of additional sediment and nutrients on water bodies. Several streams, including Croy Creek, Greenhorn Creek, and the Big Wood River, are not supporting their designated beneficial uses due to sediment. Warm Springs Creek is listed for phosphorous. These impairments are likely to be exacerbated for the next 2-3 years with additional inputs from increased runoff from burned areas.

Human Life and Safety and Property

Threats to human life and safety exist within and downstream from the burned area. As described in the Hydrologist's and Soil Scientist's Specialist Reports, typical rainfall events,

likely to occur in any given year are likely to result in flooding or debris flows that could impact downstream values at risk. Based on the spatial extent and duration of typical rainfall events in this area, these post wildfire watershed responses may be widespread or localized.

Recreational use and forest access in this area is very high. Therefore, exposure of forest workers and users to post wildfire threats is also high.

In many cases, threats to property co-exist with threats to life/safety. The following narratives include descriptions of values at risk, threat and risk assessments for life, safety and property.

Life/Safety, Hydrologic Function, Soil Productivity and Property: Deer Creek Drainage, Willow Creek Drainage, Greenhorn Drainage and Cherry Creek Drainage

Threats to human life and safety exist within and downstream from the burned area. As described in the Hydrologist's and Soil Scientist's Specialist Reports, typical rainfall events, likely to occur in any given year are likely to result in flooding or debris flows that could impact downstream values at risk. Based on the spatial extent and duration of typical rainfall events in this area, these post wildfire watershed responses may be widespread or localized. Due to the severity of the burn and the rain events that occurred post fire causing large debris and overland flows, there is a very high probability that native and naturalized vegetation communities (an additional BAER value at risk) were lost. These flows reduced soil productivity, removed all stabilizing vegetation and removed the native seed bank that would provide for soil stability under natural regeneration processes. Hillslope treatments that include establishment of vegetation and rebuilding the seed bank are critical to providing for soil stability and reducing potential impacts from post-wildfire events. The use of native species would accelerate the re-establishment of the native species that were burned at high to moderate severity.

Recreational use in the Deer Creek, Willow Creek, Greenhorn and Cherry Creek drainages is very high. Access is also high due the extensive network of roads and trails. Therefore, exposure of forest workers and users to post wildfire threats is also high. There are also several seasonally and year-round occupied residences located downslope, down drainage and adjacent to burned areas in both the Deer Creek and Greenhorn drainages that are at risk from post-fire threats.

The following narratives include descriptions of values at risk, threat and risk assessments for life and safety:

Deer Creek – Threats to Forest users, including campers within designated dispersed sites, include flooding resulting from increased sedimentation into Deer Creek, debris flows and loss of egress along the Deer Creek and Jolly Sailor roads. Given their proximity to Deer Creek, there is a very high risk to residents of the yurts for flooding and damage from debris flows. There is one year round residence located adjacent to the Forest that is at high risk for damage from debris flows. All soil stabilizing vegetation was removed in the proposed treatment area and therefore the BAER Risk is **Very High**.

Willow Creek Drainage - Threats to Forest users, including dispersed campers and hunters, and workers along the Willow Creek Road from flooding resulting from increased sedimentation into Willow Creek Creek, debris flows off unstable hillslopes and loss of egress. All soil stabilizing vegetation was removed in the proposed treatment area and therefore the BAER Risk is **Very High**.

Cherry Creek Drainage - Threats to Forest users, including dispersed campers and hunters, include flooding resulting from increased sedimentation into Cherry Creek, debris flows and loss of egress along the Cherry Creek Road and in the Cherry Creek Day Use Area. All soil stabilizing vegetation was removed in the proposed treatment area and therefore the BAER Risk is **Very High**.

Greenhorn Drainage- Threats to Forest users and workers on developed trails, in the Greenhorn Trailhead and Day Use area, and at the Greenhorn Guard Station, include flooding resulting from increased sedimentation into Greenhorn, Cow, Sawmill and Mahoney Creeks, debris flows and loss of egress along the Greenhorn and Limekiln Gulch Roads. There are several year-round residences located at the bottom of the hillslope in the Greenhorn drainage that are at risk for direct damage from hillslope debris flows. In addition, houses located on the south side of the Greenhorn road are susceptible to flooding as the road acted as a berm during a couple of post-fire storm events, directing water directly onto the residential properties. All soil stabilizing vegetation was removed in the proposed treatment area and therefore the BAER Risk is **Very High**.

Other threats include potential for establishment and spread of noxious and invasive plant species. Known noxious and invasive plant species populations exist within and immediately adjacent to the burned area, and they will compete aggressively with native species for space and nutrients.

Aerial seeding treatments utilizing a seed mix containing a sterile cereal grain (sterile triticale) and two documented, soil stabilizing native grass species (Idaho fescue and Bluebunch wheatgrass) is recommended to address the threats described above for the listed drainages. Seeding following wildfires is often accomplished with seed mixes comprised of a fast growing introduced species, such as sterile cereal grains. Though perhaps beneficial for short-term erosion control, seeding solely with sterile cereal grains could interfere with long-term watershed protection if it delays the regeneration of deep-rooted native perennials (Taskey et al., 1989). Coupled with reduced native regeneration, seeding solely with sterile cereal grains creates a marked reduction of plant cover in the second post-fire year (Keeley 2005). Second and third growing seasons are typically when aggressive noxious and non-native plant species such as spotted knapweed a biennial occur. This would not be effectively deterred with the sterile cereal grains but would be deterred through inclusion of long-lived perennial species. As indicated by Brown (2004) And Hunter (2006), multiple functional guilds and species richness in seed mixtures may increase community competitiveness and provide a buffer against non-native plant invasions.

The native species selected as part of the seed mix are very deep rooted and produce vegetative ground cover that will provide rapid stabilization of slopes that burned at moderate and high severity. These characteristics provide increased organic matter in soils and more rapid infiltration rates. The root biomass of selected native species exceeds that of the annual cereal grains. By providing the stability necessary to hold soils on site during the first two years, soil productivity and hydrologic function is protected.

Idaho fescue was chosen because it has abundant growth of fine leaves that provide effective ground cover. It produces an extensive fibrous deep root system that is an excellent erosion control and improves soil structure (Hafenrichter et al, 1968). It has good stand maintenance, provides excellent ground cover and has a dense root mass that improves soil structure, holds the soil in place, and hinders the invasion of weeds and cheatgrass once firmly established (Ogle 2010).

Bluebunch wheatgrass is among the most drought-resistant native bunchgrasses. Rooting depth of bluebunch wheatgrass ranges from 4.6 feet (1.4 m) to 6.6 feet (2 m). Roots of mature bluebunch wheatgrass generally are deeper in the soil profile than those of cheatgrass, allowing the plant to acquire soil moisture much better below 1.6 feet (0.5 m) and be an aggressive competitor. It spreads vegetatively by tillers. Its drought tolerance, combined with extensive root systems and good seedling vigor, make this species ideal for soil erosion control and reclamation in areas receiving 10 to 20 inches annual precipitation (Ogle 2010).

Other possible treatments considered included application of wood or straw mulch. While straw could be more effective at reducing the risk in the first year, it would be less effective in subsequent years and was not recommended based on four factors. First, the treatment units are primarily on sites that were shrub/grass communities pre fire. High and moderate burn intensity in these units removed all above ground vegetation and straw mulch would be very susceptible to redistribution by wind. Second, much of the area of the treatment units includes slopes greater than 50% and straw mulch effectiveness is reduced above that gradient. Third, post-fire flood events moved much of the native seed bank off hill slopes. Reestablishment of perennial, stabilizing species would occur very slowly and mulch effectiveness would end before natural stabilization via perennial grass recovery. Fourth, the cost of mulching is much higher than seeding and would not have proportionally higher effectiveness. Wood mulch was not recommended primarily based on its estimated cost and effectiveness compared to seeding. While it would reduce the risk more effectively than straw mulch or seeding in year 1, the lack of native seed bank would limit longer term recovery.

In addition to mitigating the threats to critical BAER values **Human Life and Safety, Soil Productivity, Hydrologic Function** and **Native and Naturalized Vegetative Communities**, seeding will provide direct benefits to high value resources, specifically sage-grouse habitat, and big game winter range. The Beaver Creek Fire burned 3,890 acres of sage-grouse habitat burned at moderate and high severity in the Willow Creek watershed. The fire burned approximately 19,300 acres of big game winter range, and 11,575 of those acres are on the Sawtooth National Forest in Willow Creek, Deer Creek, Greenhorn Gulch, and Warm Springs Creek. In addition to the Beaver Creek Fire, two other 2013 fires on the Sawtooth National Forest burned big game winter range. These fires burned approximately 27,360 acres of winter range on national forest lands and adjacent BLM, state, and private. At a larger scope, multiple fires that have burned close to 500,000 acres in 2012 and 2013 have negatively impacted high percentages of these important habitats. It is expected that habitats consisting of native vegetation not extensively damaged by wildfire will experience increased pressure from the wildlife populations as they seek forage and cover. Some of these habitats exist in close proximity to ranches, communities, and major travel routes, where vehicle-wildlife conflicts can increase the risk to human safety, animal mortality, and property damage. Sage-grouse are a sagebrush-obligate bird that depends on sagebrush throughout the year, for both cover and food. Sagebrush and bitterbrush provide the thermal cover that is critical for big game during winter months, and essential food sources for deer, elk and other wildlife. Additionally sagebrush, bitterbrush and bunchgrass communities provide nesting habitat for birds and small mammals. Sagebrush bunchgrass community recovery to a fully functioning habitat for sage-grouse and big game with the proposed treatments will lessen the time where sage-grouse productivity and survival will be depressed given the consumption of shrubs due to recent fire history.

References:

Beyers, J.L. 2004. Postfire seeding for erosion control; effectiveness and impacts on native plant communities. *Conservation Biology* 18:947-956.

Brown, C.S. 2004. Are functional guilds more realistic management units than individual species for restoration? *Weed Technology* 18:1566-1571.

Hafenrichter, A.L., J.L. Schwendiman, H.L. Harris, R.S. MacLachlan, & H.W. Miller 1968. Grasses and legumes for soil conservation in the Pacific Northwest and Great Basin States. USDA Handbook No. 339, Washington, D.C.

Hunter M.E., P.N. Omi, E.J. Martinson and G.W. Chong. 2006. Establishment of non-native plant species after wildfires: effects of fuel treatment, abiotic and biotic factors, and post-fire grass seeding treatments. *International Journal of Wildland Fire* 15:771-281.

Keeley, J. E. 2004a. Ecological impacts of wheat seeding after a Sierra Nevada wildfire. *International Journal of Wildland Fire* 13:73-78

Keeley, J. E., C. D. Allen, J. Betancourt, G. W. Chong, C. J. Fotheringham, and H. D. Safford. 2006. A 21st century perspective on postfire seeding. *Journal of Forestry* 104:103-104.

Ogle, D.G., L. St John and T.A. Jones. 2010. Plant guide for bluebunch wheatgrass (*Pseudoroegneria spicata*). USDA-Natural Resources Conservation Service. Idaho and Washington Plant Materials Program

Taskey, R.D., Curtis, C.L., Stone, J., 1989. Wildfire, ryegrass seeding, and watershed rehabilitation. In: N.H. Berg (technical coordinator), *Proceedings of the Symposium on Fire and Watershed Management*, Sacramento, CA. USDA Forest Service General Technical Report PSW-109, pp. 115–123.

Life/Safety and Property: Deer Creek Designated Dispersed Sites, Warm Springs Designated Dispersed Sites, Baker Creek Designated Dispersed Sites, Deer Creek Trailhead Deer Creek Picnic/Camp Area - Threats to campers include flooding, debris flow and loss of egress. The probability that life and/or safety could be impacted is likely and the consequences would be major. Therefore, the BAER Risk is **Very High**. Closure and signing treatments are recommended.

These recreational facilities are Forest Service property due to investment of time and equipment into site development and maintenance. Probability of damage or loss at these sites is likely and the magnitude of consequences is minor to moderate. No BAER treatments are proposed to protect these sites as property.

Baker Lake Trailhead: No threats identified based on field and map review

Easley Hot Springs Campground: No threats identified based on field review.

Life/Safety and Property: Cathedral Pines Camp (not USFS Property) - House/cabin on the bend of the main stem of the Big Wood River may be impacted by scouring or deposition of the river bank. Approximately 18 inches of sediment from recent post wildfire flows deposited in the bend/pool. The recommended response action is to notify camp owners/managers of this concern.

Life/Safety and Property: Greenhorn Day Use Area and Trailhead - The threat that people could be impacted by flash flooding or debris flow at the parking lot is low but becomes higher closer to the creek or trail bridges. Because the valley bottom is neither steep nor confined in this area, it appears unlikely that day users would be severely impacted by flooding. Two out of three trail bridges are burned. The probability that life and/or safety could be impacted is possible and the consequences would be major. Therefore, the BAER Risk is **High**. Warning signs are recommended. Debris from the burned bridges also presents a safety threat to forest workers and area users. Removal of hazardous debris is recommended.

The trailhead and day use area is Forest Service property. The threat of sediment deposition on the parking lot and clogging of culverts under the parking lot was determined. Probability of damage or loss at this facility is likely and the magnitude of consequences is moderate. Therefore, the BAER Risk is **High**. A variety of BAER treatments are proposed to protect this facility.

Life/Safety and Property: Greenhorn Guard Station - Burned debris at this site contains physical and chemical hazards that present a safety threat to forest workers. Additionally, overland flow is likely to wash some of these materials off site. The probability that safety could be impacted is likely and the consequences would be moderate. Therefore, the BAER Risk is **High**. Removal of the hazardous debris is recommended.

The outhouse is Forest Service property. Probability of damage or loss at this facility is likely and the magnitude of consequences is moderate. Therefore the BAER risk rating is **High**. Sand bags are recommended to protect this facility.

Property: Dollarhide Snotel Site (not USFS property) – The Snotel site is adjacent to a steep burned hill-slope. The probability of sediment deposition on this site is likely and the consequences would be moderate. Therefore, the BAER risk rating for impacts to the site from sediment is **High**. The risk that hazardous trees adjacent to the site could impact equipment at the site and/or present a threat to the safety of Forest Service or NRCS workers at the site is also **High**. Recommended response actions include erosion control treatments, removal of hazardous trees and notification to Ron Abramavich or Phil Morrissey at the NRCS to apprise them of potential hazards and proposed treatments.

Roads, Trails and Bridges

Travelers along routes (roads and trails) within and downslope from hill-slopes burned at a moderate to high severity are at increased risk due to threat of falling trees/snags, rocks, and other debris. The probability that life and/or safety of road or trail users could be impacted is possible and the consequences would be major. On roads, loss of access and egress is also a threat. The probability that loss of access/egress could occur is likely and the consequences could be moderate or high. Therefore the BAER Risk is **High to Very High**. Recommended treatments include storm proofing, storm inspection and response, limited hazardous tree removal and road closure.

The road and trail network is Forest Service property. Threats include erosion of road surface, deposition of debris on road surface and/or impacts to road drainage structures.

Life/Safety and Property: Forest Service Roads Affected by the Fire - There are 64 miles of Forest Service Roads in the burned area. Of these 64 road miles, approximately 21 miles are routed directly through either moderate or high soil burn severity areas. However, the vast

majority of the 64 road miles have been and will continue to be affected by post wildfire run-off, scouring or deposition. Threats to the road include erosion of road surface, impacts to road drainage structures, deposition of eroded sediment in adjacent streams, deposition of debris on road surface, loss of access/egress and associated threats to the safety of road users. These roads are located in Willow Creek, Deer Creek, Greenhorn Creek, Warm Springs, and Baker Creek drainages.

The probability that life and/or safety of road or users could be impacted is possible and the consequences would be major. The probability that loss of access/egress could occur is likely and the consequences could be moderate or high. Therefore the BAER Risk is **High to Very High**.

The roads are Forest Service property. The probability of damage or loss is very likely and the magnitude of consequences is moderate to major. Therefore the BAER risk rating is **High to Very High**.

Recommended response actions include closures, warning signs, a variety of road storm proofing treatments, storm inspection and response and a limited amount of hazardous tree removal to provide for the safety of BAER workers.

Life/Safety and Property: Wolftone Bridge and Warm Springs Bridges #7 and #8 - Threats to the bridge include clogging by post wildfire debris, overtopping, and erosion of road surface and erosion of material around the bridge abutments. Failure of the bridge would result in loss of access/egress and could pose a threat to the safety of road users. The probability that life and/or safety of road users could be impacted is possible and the consequences would be major. The probability that loss of access/egress could occur is likely and the consequences could be moderate or high. Therefore the BAER Risk is **High to Very High**. Recommended response actions include storm inspection and response.

The bridges are Forest Service property. Threats to the bridges include clogging by post wildfire debris, overtopping, erosion of road surface, erosion of material around bridge abutments and failure of the bridge. Probability of damage or loss is likely and the magnitude of consequences is moderate to major. Therefore the BAER risk rating is **High to Very High**. Recommended response actions include reinforcement of bridge abutments and storm inspection/response.

Life/Safety and Property: County and State Roads – At the time of this report, Croy Creek Road was the only major county through-fare that is likely to be impacted. The BAER Team Engineers will continue to work with road engineers from other potentially affected agencies to verify this determination and identify/describe any additional concerns.

Life/Safety and Property: Forest Service Trails Affected by the Fire - There are 118 miles of trails within the burned area.

Erosion of trail surface and sediment delivery to trails is likely to occur on an ongoing basis for the next 3 years. Impacts are likely to occur adjacent to steep burned hill-slopes or streams and at stream crossings. Of these 118 miles, approximately 63 miles are routed directly through either moderate or high soil burn severity areas. However, the vast majority of the 118 trail miles have been and will continue to be affected by post wildfire run-off, scouring or deposition. Threats to safety of trail users from flooding and/or debris flow and from hazardous trees exist,

particularly adjacent to steep burned hill-slopes, at stream crossings and/or in flood prone areas adjacent to creeks.

The probability that life and/or safety of trail users could be impacted is possible and the consequences would be major. Therefore the BAER risk rating is **High**.

The trails are Forest Service property. The probability of damage or loss is very likely and the magnitude of consequences is moderate to major. Therefore the BAER risk rating is **High to Very High**.

Recommended response actions include closures, warning signs, a variety of trail storm proofing treatments, storm inspection and response, removal of hazardous materials (burned signs and carsonites) and a limited amount of hazardous tree removal to provide for the safety of BAER workers.

Life/Safety and Property: BLM Trails in Democrat and Wilson Gulch Area - Threats to life and/or safety and property include flooding, debris flow, deposition or erosion of trail Surface. In this area there are minimal hazardous trees. There are approximately 15 miles of trails are at risk (John Kurtz, BLM, 208-732 -7296). Designated trails don't connect to USFS lands but undesignated might. Undesignated trails are not considered property at risk but may divert and concentrate overland flow, slightly increasing erosion and sedimentation in places. Lambs Gulch Trail crosses and runs adjacent to stream. Dallan and Schroder observed evidence of flooding and deposition near trailhead on 09/06/2013 following a recent rainstorm.

The probability that life and/or safety of trail users could be impacted is possible and the consequences would be major. Therefore the BAER risk rating is **High**. The trail network is BLM property. Threats include erosion of trail surface, deposition of debris and/or impacts to trail drainage structures. Probability of damage or loss to roads and trails is likely and the magnitude of consequences is moderate. Therefore the BAER risk rating is **High**.

The recommended response action is notifying BLM of potential need for treatments. Trail storm inspection and response, storm proofing, removal of hazardous materials (burned signs and carsonites), installation of warning signs and directional signs to lower the risk of trail users being impacted by flooding, debris flow and/or getting lost and/or closure to protect life and safety are options.

Life/Safety and Property: Frenchman's Bend Hot Springs - Threats to life and/or safety include flooding or debris flow while people are in the hot springs. The probability that life and/or safety could be impacted is possible and the consequences would be major. Therefore the BAER Risk is **High**. Recommended BAER response actions are closure and signing.

Life/Safety and Property (Not on NFS lands): Homes, Driveways and Private Property in Greenhorn Canyon - The threat that life/safety could be impacted by flash flooding, debris flow or deposition is high in multiple locations in this area. Homes and driveways adjacent to steep burned hill-slopes or in flood prone areas adjacent to the stream channel are at higher risk. Migration of the channel within the valley bottom is another process that could impact life/safety and property in this area. Homes, driveways and other improvements in this area are private property. BAER risk ratings were not determined.

Life/Safety and Property (Not on NFS lands): Blaine County Animal Shelter - This facility is a non-profit organization located on private property. Threats to life and/or safety and property

include flooding, debris flow and deposition. BAER risk ratings were not determined. The BAER Team has communicated these concerns to shelter managers and informed them of the NRCS EWP program through which they could potentially obtain erosion control advice and/or financial assistance. Additionally, coordination with County Emergency Services on early warning and evacuation strategies was recommended.

Property (Not on NFS lands): Sun Valley Co. Snow Making Infrastructure - Snow making infrastructure could be impacted if water in Big Wood River and/or Warm Springs Creek contains high concentrations of sediment when river water is being drawn for snow making. However, it is highly unlikely the river would be turbid when they are making snow (Oct-Apr). In Warm Springs Creek, it is likely that sediment deposition and/or scouring may impact the drafting pool. With the exception of informing the potentially affected party, no response actions are recommended.

Life/Safety and Property (Not on NFS lands): Deer Creek Pond System - These ponds are located on private land and are considered property as they are not natural features on the landscape. Loss of pond capacity due to deposition of sediment and debris is very likely to occur. Hatchery fish reside in the ponds.

Natural Resources

Natural Resources: Loss of Native Plant Communities from Invasion of Noxious Weeds

Based on information received from the SNF, BLM/Twin Falls District, and Blaine County CWMA from pre-fire treatments and inventories, the Beaver Creek Fire area and adjacent lands contained 13 noxious Idaho plant species and 6 non-native invasive plant species.

Existing noxious and non-native invasive plant species on public and private lands

Hoary Alyssum (<i>Berteroa incana</i>)	Idaho noxious species
Diffuse Knapweed (<i>Centaurea diffusa</i>)	Idaho noxious species
Spotted Knapweed (<i>Centaurea stoebe</i>)	Idaho noxious species
Canada thistle (<i>Cirsium arvense</i>)	Idaho noxious species
Rush skeleton weed (<i>Chondrilla juncea</i>)	Idaho noxious species
Field Bindweed (<i>Convolvulus arvensis</i>)	Idaho noxious species
Houndstongue (<i>Cynoglossum officinale</i>)	Idaho noxious species
Whitetop (<i>Lepidium draba</i> aka <i>Cardaria draba</i>)	Idaho noxious species
Dalmatian toadflax (<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>)	Idaho noxious species
Yellow toadflax (<i>Linaria vulgaris</i>)	Idaho noxious species
Black Henbane (<i>Hyoscyamus niger</i>)	Idaho noxious species
Scotch Thistle (<i>Onopordum acanthium</i>)	Idaho noxious species
Tansy Ragwort (<i>Senecio jacobaea</i>)	Idaho noxious species
Burdock (<i>Arctium minus</i>)	Non-native invasive
Cheatgrass (<i>Bromus tectorum</i>)	Non-native invasive
Bull thistle (<i>Cirsium vulgare</i>)	Non-native invasive
Curlycup Gumweed (<i>Grindelia squarrosa</i>)	Non-native invasive
Russian thistle (<i>Salsola tragus</i>)	Non-native invasive
Yellow Salsify (<i>Tragopogon dubius</i>)	Non-native invasive

Spotted and diffuse knapweed, dalmatian and yellow toadflax, rush skeletonweed, Canada thistle, and cheatgrass are the most widespread species with the highest risk of potential spread

into the burn. Other noxious weeds known to occur on SNF, BLM, state and private lands listed in Table 5, are also very aggressive and would require immediate attention if identified in the burn or suppression activity areas.

High and Very High Risk Areas: In high and moderate SBS areas, the vegetation canopy and the effective ground cover that dissipates rainfall and regulates snowmelt runoff was removed. Even with average precipitation, erosion rates will be high. This was experienced on September 3-5, 2013 when rainstorm events resulted in loss of topsoil and ash from the burned plant litter and duff that replenishes the soil nutrient pool. Natural vegetation recovery is jeopardized by loss of topsoil, loss of native seed bank and reduced the soil productivity.

The time required for natural recovery of revegetation to protect the soil surface in high and moderate SBS areas is expected to vary. The non-forest cover types (mostly between 20-60% with southerly aspects) will likely take 5 - 10 years while forested lands may take up to 10 or more years to establish pre-fire vegetative ground cover. Lack of vegetative cover and litter can contribute to chronic erosion and perpetual hillslope instability.

Also of concern is recovery of native plant diversity due to establishment and/or spread of noxious and non-native plant species in high and moderate severity burn areas. Plant communities and soil productivity can be severely impacted in the burn due to the spread of noxious weeds from existing populations and the introduction of noxious weeds and invasive species into new areas. At the time of the initial attack fire suppression activities and the following 3 days of activities, no measures were taken to prevent the introduction and spread of noxious and non-native plant species. Fire suppression resources may have been a vector for introduction and/or spread of existing populations. Likely problem areas include where soil was disturbed during suppression efforts, where people and equipment worked, and where equipment was parked. There are known infestations of spotted and diffuse knapweed in the the Buttercup ICP and Deer Creek helibase, resources that did not utilize the vehicle washer regularly and were contaminated in these areas may have spread noxious species during suppression activities into new areas within the fire perimeter. The proposed BAER stabilization treatments could also introduce non-native species during implementation. In addition, recreational use of the roads and trails leaves the burned area highly susceptible to the expansion and introduction of noxious and invasive plant species.

Moderate to high SBS areas are most vulnerable to expansion of existing populations of new noxious and non-native plant species due to removal of the litter layer, exposed soils, and reduction in canopy cover and shading. In areas of high SBS areas, native herbaceous seed banks may have also been compromised, requiring an extended timeframe for native perennial species to become reestablished. Noxious and non native species are likely to establish at a much faster rate, further impacting emerging natives. As a consequence of fire suppression efforts using heavy equipment, the native plant community and seed bank were also greatly disturbed, leaving these areas vulnerable to new noxious/invasive species infestation.

Keeping new or expanding noxious and non-native plant species from becoming established is a high priority across federal, state, and private lands ownership boundaries. Non-native invasive species often either have rhizomatous root structures, or produce abundant seed coupled with high germination rates enabling seedlings to establish rapidly following fire. The presence of non-native invasive species may prevent establishment of desirable perennial grasses and can increase future fire hazards. Prevention and treatment of invasive species prior to populations becoming established and expanded is a key point in restoring desired native vegetation within the burn area and reducing long-term cost of containment, control and

eradication.

An aggressive monitoring and treatment program is needed to deal with noxious and non-native invasive plants. This effort is expected to be a short, mid, and long-term process.

Natural Resources: Soil Productivity - Very High and High risk to soil productivity within areas that burned at moderate to high severity. The probability for accelerated erosion is very likely with subsequent mass erosion, hill-slope sedimentation, and mud flows. The loss of over-story vegetation, effective ground cover, and surface organic matter will leave the soil resource susceptible to erosive forces for 5 to 7 years. Considerable impacts to soil productivity are expected from the erosion of exposed soil and nutrient-rich ash off-site. The increased potential for the spread of invasive plant species and noxious weeds from known populations within and adjacent to the more susceptible burned area will further intensify the impacts to soil productivity over the long term. Additional, indirect threats to soil productivity include impacts from destabilized features at mine sites that can be eroded onto NFS lands, failures of roads and trails with high volumes of eroded materials delivered onto generally stable or productive soils, and unauthorized motorized vehicle access across NFS lands will likely increase due to the loss of physical and vegetative screens that previously limited access.

As illustrated on the soil burn severity map these areas are widespread across the burned area. Generally, moderate soil burn severity associated with burned bitterbrush/sagebrush communities and high soil burn severity is associated with burned forested stands. There is a high probability for widespread hill-slope erosion, sedimentation, and mud/debris flows. These post wildfire processes are expected to impact soil quality by eroding exposed soil and nutrient-rich ash off-site, as well as by increasing the potential for spread of noxious weeds and invasive plant species.

The following response actions lower the risk of threats to soil productivity: Aerial Mulch (erosion control), Early Detection and Rapid Response for Noxious Weeds (lower risk of chronic long-term erosion in area where noxious weeds become established), Road and Trail Drainage Treatments (lower risk of increased hill-slope erosion adjacent to roads and trails) and Road and Trail Warning Signs (lower risk of retarding natural recovery by ground disturbance off roads and trails).

Natural Resources: Buttercup Mine Area - Loss of soil productivity and impacts to water quality were observed in the field at several locations where un-reclaimed mine dumps/waste rock piles occur on the landscape. Generally, these areas are localized and are naturally slow to recover regardless of fire impacts. Excessive runoff and erosion from burned hill-slopes above toxic tailings piles has de-stabilized and mobilized tailings in many of these locations. Following field review, the BAER Geologist/Minerals Specialist determined that, with the exception of the Buttercup Mine, most sites were not accessible for BAER treatments.

The mine sites are on Forest Service property. The probability that post wildfire runoff will accelerate runoff and erosion from these areas is very likely and the magnitude of consequences is moderate to major. Therefore the BAER risk rating is **High to Very High**.

Response actions to reduce runoff and erosion from hill-slopes above the Buttercup tailings piles are recommended to protect soil and water quality below the site.

Natural Resources: Water Quality and Beneficial Uses of Water

Water quality within and adjacent to the fire is generally good with a few exceptions. Several drainages include stream segments listed as “not supporting” their beneficial uses, including Greenhorn Creek, Warm Springs Creek, and the Big Wood River. The designated beneficial uses for the Big Wood River are: cold water aquatic life, salmonid spawning, primary and secondary contact recreation, special resource water, and drinking water supply. The Big Wood River has an approved Total Maximum Daily Load (TMDL) dated May 15, 2002 (IDEQ 2002). TMDLs were established for sediment, nutrients, and bacteria. Recent studies of Big Wood River indicate that stream temperatures are above desired levels to protect the health of coldwater fish such as rainbow trout.

A water rights review for surface water diversions within the fire area and downstream in the Big Wood River below the town of Hailey, Idaho was conducted by the Idaho Department of Water Resources at the request of the 2007 Castle Rock BAER team. This review identified numerous small surface water domestic systems within the fire area and downstream in the Big Wood River. None of these domestic systems alone (approximately 12 systems) serve enough people to be identified as a “public regulated water system”. Numerous other surface water rights exist for uses such as irrigation, commercial, geothermal, recreation, aesthetics, and fish propagation.

Natural Resources: Fisheries

One sensitive species fish species, the Wood River Sculpin, occurs within the burned area and within the receiving water-bodies downstream. Streams within the burned area support other native and non-native fish species, including mountain whitefish, rainbow trout and brook trout.

The fire likely had adverse effects on fish habitat within the fire boundaries as well as downstream for several miles. In channel wood and shrub vegetation was burned. Riparian areas within many of the drainages were also burned. Several debris flows were recorded within creeks in the fire perimeter which caused extensive loss of riparian vegetation, valley floor mobilization, channel reorganization and eroded stream banks. Tenfold increase above background levels in turbidity were measured and observed for several days within Baker, Warm Springs, Deer Creek and the Big Wood River following several localized rain events. Reports of fish mortalities, following these rain events, in the Big Wood River as well as Warm Springs Creek were reported by the public to the Fish and Game-Shoshone field office. Fish mortalities were observed by SNF fish biologists in Warm Springs Creek as well as Deer Creek. The spatial size and number of fish which may have experience lethal or even sub lethal effects from these increases in turbidity, decreases in dissolved oxygen or increases in temperature can only be speculated at this time. It is believed that Baker, Warm Springs and Deer Creeks likely experienced a moderate to high amount of fish kill within these watersheds. To understand the possible degree of the fish kill it will be necessary for SNF Biologists to conduct a more extensive survey in the future.

Natural Resources: Wildlife

The Beaver Creek Fire area provides habitat for many species of wildlife. Habitat for two Endangered Species Act (ESA) listed species, one candidate for ESA listing, several Region 4 Forest Service sensitive species, several big game species, and three Sawtooth Forest management indicator species occur within the burned area. Effects of the fire upon wildlife will vary by species. No direct mortality of any wildlife was observed by fire personnel, though reports of injured deer were reported. Mule deer, pronghorn antelope, elk, moose, black bear, gray wolf, and several species of birds were observed during the fire. In general a reduction of hiding and thermal cover is expected in those forested stands that burned at sufficient intensity

to cause over-story tree mortality. This will likely correspond to an increase in forage for herbivores in those same areas.

Noxious weed and invasive species establishment and expansion is a threat identified that will affect wildlife species habitat. Refer to the noxious weed treatment assessment and specification form for specifications for treating and monitoring noxious weeds.

Aspen regeneration could be a concern if livestock are allowed to return to the burned area prior to aspen suckers reaching sufficient heights (approximately 6 feet) to avoid browsing by livestock, or if elk and deer use is concentrated in areas of new aspen growth.

Natural Resources: Range Allotments

The burned area contains 5 active grazing allotments on the Fairfield Ranger District, and 6 (5 active and 1 vacant) grazing allotments on the Ketchum Ranger District; totaling approximately 58,000 acres. Grazing allotments include sheep and cattle allotments. Structural range improvements including fences and troughs located within the fire perimeter were impacted by the fire and are likely to be impacted by post wildfire erosion.

Fire and post wildfire effects on structural range improvements, grazing and grazing management and need for rest treatments for soil and vegetation recovery were assessed.

The Rangeland Management Resource Report contains grazing management and monitoring recommendations for the affected allotments. If seeding or mulching treatments are implemented on allotments, components of the Rangeland Monitoring Plan should be incorporated into the BAER Treatment Effectiveness Monitoring Plan.

Cultural and Heritage Resources

Cultural and Heritage Resources: Warm Springs Eligible Historic Sites - Threats include loss of integrity from post wildfire erosion and/or other BAER response actions. There is a potential eligible site recently uncovered as a result of debris flow scouring. Erosion of tailings has accelerated due to increased post wildfire runoff and may be impacting soil and water quality down-slope and down-stream. The probability that the historic structure could be impacted is likely and the consequences would be moderate. Therefore the BAER Risk is **High**. Road drainage improvements adjacent to the site are recommended to reduce the threat of excessive post wildfire runoff and erosion at this site.

Cultural and Heritage Resources: Baker Creek and Warm Springs Creek Historic Recreational Residences - These residences are located on NFS lands, privately owned and are sites of historical significance. In both locations, there are large diameter trees blocking the channel near the residences. They are capturing burned woody debris. During high flows, this is likely to cause flooding at the houses. A footbridge crossing Baker Creek is also likely to trap debris, wash out and/or become entrained in flood flows.

The probability that life and/or safety could be impacted is possible and the consequences would be major. The probability that the historic structure could be impacted is likely and the consequences would be moderate. Therefore the BAER Risk is **High**.

Recommended response actions are channel debris clearing (removing the large tree, other debris and the footbridge), notifying the homeowners of increased risk and sandbagging to protect the historic structures.

B. Emergency Treatment Objectives:

- Mitigate, to the extent possible, threats to personal injury or human life of forest visitors, permit holders and Forest Service employees at administrative and recreation facilities or while traveling select roads and trails on NFS lands within or downstream of the burned area.
- Mitigate potential post-fire impacts to water quality from mine or CERCLA sites within or downstream of the burned area.
- Warn users of Forest roads and trails of hazards present in the burned area. Consider temporary closure to protect public users of NF lands.
- Protect or mitigate potential post-fire impacts to critical natural resources and significant cultural resources within or downstream from the burned area.
- Protect or minimize damage to high-value NFS investments within the burned area. Minimize damage to key NFS travel routes within and downstream the fire boundary.
- Treat invasive plants that are a threat to naturalized ecosystems by minimizing the expansion of existing populations in the burned area and control of expected invasion of noxious weeds within and adjacent to the area where soils/vegetation was disturbed as a result of fire suppression activities.
- Assist cooperators with the interpretation of the assessment findings to identify potential post-fire impacts to communities and residences, domestic water supplies, public utilities (including power transmission facilities, cellular towers, roads, and other infrastructure).

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

Land - 75% Channel – 80% Roads/Trails - 60% Protection/Safety - 80%

D. Probability of Treatment Success

Treatment	Years after Treatment		
	1	3	5
Land	90	70	--
Channel	--	--	--
Roads/Trails	70	75	80
Dependent on Regional approval for treatments less than \$500,000.			
Protection/Safety	80	70	60
Initially, visitors will heed the warning signs. Complacency is expected after the initial year unless there is a damaging event.			

E. Cost of No-Action (Including Loss):

Refer Values at Risk Analysis for the Cost of No-Action and Cost of Selected Alternative (Including Loss).

Benefit:Cost ratio is 1.1. Very high probability of loss if treatments were applied is based on field observations of loss accrued after 2 damaging rainstorms. For most treatments, there is a high probability of loss even if the treatment is applied but a low probability the loss would be as large as it would be if treatments were applied. The VAR analysis focused primarily on market values. Benefits such as lowering risk of impacts to life/safety, natural resources, and cultural resources were recognized in this BAER assessment but not included in the benefit:cost calculation. The accumulated benefits are not considered in the cost analysis. First, the hill-slope treatments are estimated to decrease runoff and reduce sediment by roughly 75%. This

will increase the chance of success for other treatments on roads, trails, bridges and other USFS sites at 2, 5, and 10 year (and possibly higher) design storm return intervals.

F. Cost of Selected Alternative (Including Loss): See above and Attached VAR analysis.

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input checked="" type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range	<input checked="" type="checkbox"/> Recreation
<input type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input type="checkbox"/> Wilderness
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input checked="" type="checkbox"/> Fisheries
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input checked="" type="checkbox"/> GIS	<input checked="" type="checkbox"/> Public Information Officer	

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Team Members:

Terry Hardy – Soils	Mark Dallan – Hydrology	Joe Miczulski – Recreation
Brett Guisto – Archeology	Robin Garwood – Wildlife	Mandy Roesch – Range Conservation
Bonnie Ross – GIS	David Marr – Soils	John Calabrese – Public Information
Bill Goodman – Hydrology	Scott Vuono – Fisheries	Shoshana Rosenberg- Archaeologist
Shawn Robnett – Engineering	Deb Taylor – Botany	Corey Loveland – NWS Hydrologist
Todd Touchard - Engineering	Maggie Schirack - Archaeologist	Heidie Torrealday – Minerals Specialist
Bonnie Luckman – GIS	Buz Vanskike – Safety Officer	Matt Phillips – Visual Resources
Steve Frost – Recreation	Erica Phillips - Fisheries	

H. Treatment Narrative:

(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 Response Actions

Response Action – Aerial Seeding Grass

General Description: Aerial seeding of 5,936 acres in high and moderate burn severity acres to provide for soil stabilization and reduce the potential for increased soil movement, sedimentation and debris flows in areas where all stabilizing vegetation has been removed and human life and safety is at risk. Seed would be applied to the ground surface via fixed wing aircraft. The proposed seed mix includes:

Sterile Triticale Hybrid at 5 lbs. PLS/acre
 Idaho Fescue at 3.5 lbs. PLS/acre
 Bluebunch wheatgrass at 6.5 lbs. PLS/acre

Adjustments in the seed mixture may be made depending on supply, contribution from cooperators, and application efforts by other agencies. First year stabilization would be provided primarily by the annual cereal grain (root growth and mulch post growing season) and secondarily by emerging perennial grasses. Second and third year stabilization would be provided by perennial grasses.

Location/Suitable Sites: Treatment is recommended for moderate and high soil burn severity areas within the fire perimeter where soil stability is highly compromised and there is a significant risk to soil/debris movement and loss of potential for natural revegetation. Seeding as determined necessary is recommended for the following areas:

Willow Creek Drainage: 408 acres in high to moderate SBS areas on adjacent slopes along Forest Service Road 70017 – Willow Creek.

Cherry Creek Drainage: 3 areas totaling 1,161 acres, 1 area in Cherry Creek (372 acres) and 2 areas in North Fork Cherry Creek (407 and 382 acres) above Forest Service Road 70017B Cherry Creek Road and Cherry Creek Day Use Area, and in high to moderate SBS areas on adjacent slopes.

Deer Creek Drainage: 2,143 acres within the burn area from forest boundary along Forest Service Roads 70097 – Deer Creek, 70099 - Jolly Sailor, and high SBS areas on adjacent south aspect slopes.

Greenhorn Drainage: 2,224 acres in Greenhorn Gulch drainage including areas burned during the 2007 Castle Rock Fire and reburned at moderate to high SBS above the Greenhorn trailhead and guard station along Forest Service Roads 70117- Greenhorn, and 70101 Limekiln Gulch. Identified areas include 989 acres in Limekiln and on North side of Greenhorn Trailhead, and 1235 along the upper Imperial ridgeline Sawmill Creek on the south side of the Greenhorn Trailhead.

Purpose of Response Action: The BAER team considers this treatment necessary to reduce the **Very High** risk to the accumulated critical values of **Human Life and Safety, Hydrologic Function, and Soil Productivity**. The primary objective of this treatment is to provide rapid stabilization of the soil and reduce the threats to human health and safety from post wildfire events. The areas proposed for aerial seeding are adjacent to creeks, roads, trails, trailheads, day use areas, dispersed campsites, and private residences. The areas are at high risk of flooding or debris flows and increased sediment deposition that could impact downstream values at risk. Based on the spatial extent and duration of typical rainfall events in this area, these post wildfire watershed responses may be widespread or localized.

Secondly, the treatments would protect BAER Critical Value at risk- Native and Naturalized Vegetation Communities. These communities are at very high risk due to the severity of the burn and the rain events that occurred post fire causing large debris and overland flows. These flows reduced soil productivity and removed the native seed bank leaving the area extremely vulnerable community conversion to annual invasive species and noxious weeds. Rebuilding the seed bank is critical to native community recovery.

Additionally, on the Sawtooth National Forest 3,890 acres of sage-grouse habitat and 11,575 acres of elk winter range burned. The treatments overlap with a portion of these habitats. The seeding will aid in the recovery of these habitats by providing both cover and food for sage-grouse and big game. This treatment will provide root systems and vegetative ground cover to stabilize slopes, reduce potential for debris movement off steep slopes and prevent establishment of noxious plant species in highly susceptible areas that burned at moderate and high severity.

Design/Construction Specifications:

GPS coordinates will be used to identify the aerial seeding treatment units. Seed will be aerially applied on identified treatment units. Seeding should occur in late fall or early winter which will maximize seed/soil incorporation. Seed should be broadcast directly onto snow. Aerial seed mixes are suggested mixes only and may need to be adjusted based on seed availability and PLS ratings.

Grass seeding will be applied using aerial-based equipment at the following specified rates:

Sterile Triticale Hybrid at 5 lbs. PLS/acre X 5,963 acres = 29,815 lbs. PLS

Idaho Fescue at 3.5 lbs. PLS/ acre X 5,963 acres = 20,970 lbs. PLS

Bluebunch wheatgrass at 6.5 lbs. PLS/ acre X 5,963 acres = 38,759 lbs. PLS

Applications of seed will be conducted in areas that are not fully accessible by ground equipment. It is more efficient to use aerial application methods due to the amount of material needed for treating the large sized units.

Treatment Implementation and Effectiveness Monitoring:

Implementation Monitoring: Would be conducted by implementation team personnel at the treatment sites or staging area.

- * Was the treatment implemented as designed?
- * Were the correct species used and the correct amount of pure live seed applied?
- * Were sensitive or no-seed areas avoided?
- * Visually inspect aerial seeding to ensure approximately 5-8 seeds per square foot are applied.

Effectiveness Monitoring: Would be conducted by SNF personnel (botanist, wildlife biologist) one and five years post implementation and annually by EDRR field crew during field season.

- * Monitor units for seed germination in the spring of 2014
- * Determine seed establishment in areas seeded and compare with unseeded areas.
- * Monitor for noxious weed establishment and cheatgrass invasion.
- * The use of transects and fixed plots will be used to sample vegetation.

Determine if additional seeding/treatment is necessary.

Response Action - Aerial Mulching and Seeding

General Description: Agricultural straw mulch will be applied to the ground surface by helicopter (and spread with hand crews as necessary) to achieve cover of uniform thickness (as specified below). Straw mulch helps secure seeds that are stored in the soil, or applied as an emergency treatment by maintaining a favorable moisture and temperature regime for seed germination and growth.

Straw mulch replaces the ground cover consumed by the fire and protects the soil from erosion and loss of nutrients. Ground cover is needed to accelerate recovery of native vegetation and to minimize the potential for spread of noxious weeds and invasive plant species in susceptible burned areas. The mulch treatments decrease the estimated soil erosion and subsequent sediment delivery to the streams and reduce downstream peak flows by absorbing rainfall and allows pre-wetting of water repellent soil.

Aerial seed (concurrently with mulch) 1,455 acres to accelerate the establishment native vegetation in high and moderate SBS, increase the probability of success for soil stabilization, and to prevent additional soil productivity loss. The seeding applications are most effective beyond the first growing season

Straw mulch helps secure seeds that are stored in the soil, or applied as an emergency treatment by maintaining a favorable moisture and temperature regime for seed germination and growth.

Location/Suitable Sites: Four treatment areas totaling 1,455 acres. The proposed treatment units are in Baker Creek, Greenhorn/Imperial Gulch, and Deer Creek drainages. See Treatment Map for exact locations.

Straw Mulch and Seed Treatment Areas

Treatment Area	Area Acres	Treatable Acres
Alden Gulch	1,750	525
Imperial Gulch	134	134
NF Deer Creek	1,121	336
Curran/Kinsey	1,953	965
Total Acres	4,937	1,455

Treatment units have been identified using accumulated BAER values downslope of areas prioritized as the most susceptible to erosion and highest contributors of sediment delivery to water:

- Within high burn severity
- Treatable slopes (20 to 50%) where rill initiation is expected.
- Typically on upper ½ to upper 2/3 of hillslopes (including headland erosion initiation points).

Purpose of Response Action: The BAER team considered this treatment the minimum necessary to reduce the risk to the accumulated critical values of:

- Human life and safety of forest visitors along travel routes and occupants at recreational sites in Baker Creek, Greenhorn/Imperial Gulch, and Deer Creek.
- NFS roads, trails and bridges (Baker Creek, E.F. Baker Creek, Greenhorn, and Deer Creek).
- Soil productivity and Hydrologic Function.
- Promote recovery and persistence of native or naturalized communities on NFS lands.

This treatment to replace ground cover is intended to achieve the following sequential objectives for protecting soil productivity:

- Decreasing erosion by interrupting raindrop impact and surface soil detachment.
- Increasing hill-slope obstructions to decrease slope lengths which mitigate accelerated overland flow, thereby decreasing sediment delivery.
- Protecting the native seedbed and retain moisture on the burned slopes to facilitate vegetative recovery.

- Decreasing erosion and overland flow from high soil burn severity areas upslope of roads, trails, and recreation facilities reduces the risks to human life and safety, property, and important natural resources.

The mulching treatments are estimated to lower the soil erosion and subsequent sediment delivery to the streams from 60 to 80% (ERMiT). 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.

Seeding is likely to provide erosion control and competition with noxious following germination and 1 growing season. The BAER team considered this treatment the minimum necessary to reduce the risk to the following accumulated critical values:

Design/Construction Specifications:

- Treat areas in designated units with “High” soil burn intensity that are less than 50% slope.
- Straw application rate achieves a cover of uniform thickness over 70% of treatment area at a depth of less than 2.0 inches. Application rate will be approximately 1.0 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.
- Straw must conform to Idaho or State Department of Agriculture (ISDA), Certified Noxious Weed Free Standards for Noxious Weed Free Forage and Straw (NWFFS). All straw provided will be grown in Idaho, have been planted, and harvested during the 2013 growing season. Straw shaft length will not exceed 12 inches. Only wheat straw is suitable. Additional certification for *Bromus tectorum* will also be required.
- The straw must be applied dry (less than 12 percent internal moisture content) or “conditioned” prior to loading nets to ensure proper dispersal during aerial applications. The Forest Service may randomly test bales using a moisture probe.
- Use GPS coordinates to identify the aerial seeding treatment units.
- Grass seeding will be applied using aerial-based equipment at specified rates in designated areas. Applications of seed will be conducted in areas that are not fully accessible by ground equipment. It is more efficient to use aerial application methods due to the amount of material needed for treating the large sized units.

Treatment Effectiveness Monitoring: Visually inspect randomly selected mulch treatment units for proper application rate and uniform thickness during/immediately after treatment. In each unit, measure percent ground cover using a 100ft pace transect method after treatment, and again in the spring of 2014.

Implementation and Effectiveness Monitoring for Seeding

- Were the correct species used and the correct amount of pure live seed applied?
- Were sensitive or no-seed areas avoided?
- Visually inspect aerial seeding to ensure approximately 5-8 seeds per square foot are applied. Effectiveness Monitoring: Would be conducted by SNF personnel (botanist, wildlife biologist) one and five years post implementation.
- Monitor units for seed germination in the spring of 2014
- Determine seed establishment in areas seeded and compare with unseeded areas.

- Monitor for noxious weed establishment and cheatgrass invasion.
- The use of transects and fixed plots will be used to sample vegetation.
- Determine if additional seeding/treatment is necessary.

Response Action – Aerial Seeding (without mulch – shrub dominated areas)

General Description: Broadcast (aerial and hand) seed 10,883 acres to accelerate the establishment native vegetation in high and moderate SBS, increase the probability of success for soil stabilization, and to prevent additional soil productivity loss. The seeding applications are most effective beyond the first growing season

Purpose of Response Action: The BAER team considers this treatment necessary to reduce the **Very High** risk to the accumulated critical values of **Native and Naturalized Vegetative Communities, Hydrologic Function, and Soil Productivity**. The primary objective of seeding is to minimize the spread of existing populations and deter establishment of new noxious and non-native invasive plants, reducing the threats to native plant communities and degraded soil productivity. After the first growing season, this treatment will also provide root systems and vegetative ground cover to stabilize slopes that burned at moderate and high severity. By providing the stability necessary to hold soils on site during the first two years, hydrologic function is also protected. The accelerated rate of re-vegetation with native species will aid in the recovery of the native seed bank and soil productivity that was impacted by the heavy rains and debris flows.

In addition to mitigating the threats to critical BAER values, seeding will provide direct benefits to high value resources, specifically **sage-grouse habitat**, and **big game winter range**. The Beaver Creek Fire burned 3,890 acres of sage-grouse habitat at moderate and high severity in the Willow Creek watershed. The fire burned approximately 19,300 acres of big game winter range, and 11,575 of those acres are on the Sawtooth National Forest in Willow Creek, Deer Creek, Greenhorn Gulch, and Warm Springs Creek. In addition to the Beaver Creek Fire, two other 2013 fires on the Sawtooth National Forest burned big game winter range. These fires burned approximately 27, 360 acres of winter range on national forest lands and adjacent BLM, state, and private. At a larger scope, multiple fires that have burned close to 500,000 acres in 2012 and 2013 have negatively impacted high percentages of these important habitats. It is expected that habitats consisting of native vegetation not extensively damaged by wildfire will experience increased pressure from the wildlife populations as they seek forage and cover. Some of these habitats exist in close proximity to ranches, communities, and major travel routes, where vehicle-wildlife conflicts can increase the risk to human safety, animal mortality, and property damage. Sage-grouse are a sagebrush-obligate bird that depends on sagebrush throughout the year, for both cover and food. Sagebrush and bitterbrush provide the thermal cover that is critical for big game during winter months. Besides providing essential food sources for deer, elk and other wildlife, sagebrush and bitterbrush provide nesting habitat for birds and small mammals. Additionally the deep-rooted structure of the perennial grasses and native shrubs provide for soil stabilization, reducing erosion. Sagebrush bunchgrass community recovery to a fully functioning habitat for sage-grouse and big game with the proposed treatments will lessen the time where sage-grouse productivity and survival will be depressed given the consumption of shrubs due to recent fire history.

Location/Suitable Sites: Treatment is recommended for moderate and high soil burn severity areas within the fire perimeter where native sagebrush and bunchgrass communities are unlikely to return naturally due to loss of the native seed source and/or high risk for establishment/spread of noxious weeds. These areas overlap with critical values associated

with existing native plant communities, soil productivity, hydrologic function, Forest roads, trails, bridges, culverts, and infrastructure, and sage-grouse habitat and big game winter range. 10,883 acres of aerial seeding **and** 50 acres of hand seeding are recommended in the following areas:

- Greenhorn Drainage: Areas burned during the 2007 Castle Rock Fire and re-burned at moderate SBS near the Greenhorn trailhead and guard station, and Limekiln Gulch totaling 50 acres to be hand seeded. Identified 771 acres along the upper Imperial ridgeline to Panther Gulch in areas of moderate to high SBS to be aerial seeded.
- Deer Creek Drainage: Identified areas totaling 4,590 acres within the burn area from forest boundary along roads 70097 – Deer Creek, 70099 - Jolly Sailor, and 70100 – Panther Gulch, 70103 North Fork Deer Creek, 7158 - Deer Creek Trail, and high SBS areas on adjacent south aspect slopes to be aerial seeded.
- Willow Creek Drainage: Identified areas totaling 5,522 acres from Forest boundary along roads 70017 – Willow Creek, 70017A - Willow Creek Spur, 70017B - Cherry Creek, 70096 – Ditto Flat, - Buttercup, and 70418A - Nebraska Creek and high to moderate SBS areas on adjacent slopes to be aerial seeded.

Design/Construction Specifications: Aerial applications of seed will be conducted in areas that are not fully accessible by ground equipment and where it is more efficient to use aerial application methods due to the amount of material applied. GPS coordinates will be used to identify the aerial seeding treatment units. Grass seeding will be applied using aerial-based equipment at specified rates.

Seeding rates will be 11 lbs/acre (PLS) and will consist of aggressive perennial native species. Species selection will be in proportions that will assist in cost savings and maintain native species emphasis. Perennial native grass and shrubs species will be applied fixed wing and hand application to provide for the most effective application for each site. The target costs for this treatment are:

Species		(cost X seeded acres) Xlbs/acre pls
Idaho fescue	<i>Festuca idahoensis</i>	(\$9.00 X10,993) X1lb/acre
Mountain brome	<i>Bromus marginatus</i>	(\$6.00 X10,993) X2lb/acre
Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	(\$8.00 X10,993) X2lb/acre
Basin wildrye	<i>Leymus cinereus</i>	(\$12.00v X10,993) X3lb/acre
Sandberg bluegrass	<i>Poa secunda</i>	(\$8.00 X10,993) X1lb/acre
Mountain Big Sagebrush	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	(\$50.00 X10,993) X.25lb/acre
Bitterbrush	<i>Purshia tridentata</i>	(\$25.00 X10,993) X1.75lb/acre
TOTAL		11 PLS lbs/acre
Aerial Application Costs		Approximately \$65 per acre

Additional native shrubs may be added by cooperators. The following seed mix is proposed, however, adjustments may be made depending on supply, contribution from cooperators, and application efforts by other agencies

Treatment Implementation and Effectiveness Monitoring:

- Were the correct species used and the correct amount of pure live seed applied?
- Were sensitive or no-seed areas avoided?

- Visually inspect aerial seeding to ensure approximately 5-8 seeds per square foot are applied.
- Monitor units for seed germination in the spring of 2014
- Determine seed establishment in areas seeded and compare with unseeded areas.
- Monitor for noxious weed establishment and cheatgrass invasion.
- Use transects and fixed plots to sample vegetation.
- Determine if additional seeding/treatment is necessary.

Response Action – Early Detection and Rapid Response for Treatment of Noxious Weeds

General Description: Forest Service and Blaine Cooperative Weed Management Area weed management treatment efforts will continue in the area and will include an emphasis on managing the potential for spreading weed infestations in the burned area and rehabilitated suppression activity areas. EDRR for the burned area needs to be an inherent part of the SNF weed management program. It should also include a public education element. Treatment for noxious plant species includes current management activities; annual spring/summer monitoring and herbicide treatments and follow up in the fall. This treatment will take place in accordance with the Forest Noxious Weed Management Plan. The amount of treatment will be focused on treating the 3,424 acres of known noxious weed infestations within and adjacent to the high to moderate SBS areas of the Beaver Creek Fire, and monitoring Forest roads and trails, dispersed campsites and pullouts used during suppression activities, and fire-line constructed during suppression activities.

Purpose of Response Action:

To identify and effectively treat noxious species to reduce the spread of the existing or establishment of new noxious and non-native plant species. The spread of noxious and non-native plant species could result in a reduction in the diversity of the native plant communities, and loss of soil productivity that would affect forage for wildlife and livestock in the area. EDRR treatment implemented within the next growing season and through three consecutive growing seasons would reduce the risk of spread and introduction in the Beaver Creek fire.

Location/Suitable Sites:

Locations for “EDRR include 98 miles of Forest roads and 134 miles of trails, 25 acres of dispersed campsites and pullouts used during suppression activities, 69 miles fire-line constructed during suppression activities.

Known treatment locations are in areas of high to moderate SBS that occurred within and adjacent to the 3,424 acres of know noxious/invasive plant species populations.

Design/Construction Specifications:

SNF program management personnel would conduct systematic ground surveys on Forest roads, and trails used during fire suppression activities, and in burned areas adjacent to known noxious weed infestation. Surveys would be done by vehicle, ATV and foot. Where needed, weed eradication treatments would follow these detection surveys.

Treatment Effectiveness Monitoring:

- Monitor noxious weed infestations treated with herbicide.
- GPS occurrences, size of areas of infestation, and use either transect or fixed plots to record relative abundance or coverage (to build species trend (stable, increasing) data for area.

- Monitor the seeding treatment areas for the spread and introduction of noxious/invasive and for the success of native species recovery based on species presence and cover percent.

Response Action – Erosion Control Treatment above Buttercup Mine

General Description: Erosion control treatments are recommended for a burned hill-slope above the mine site to lower runoff to a toxic tailings pile. Post wildfire hill-slope runoff is likely to exacerbate erosion of the tailings pile and increase the risk that the toxic materials could impact water quality downstream.

Locations: Burned hill-slope above Buttercup Mine Site.

Design/Construction Specifications: Heavy equipment would be used to re-contour and create surface roughness. This treatment would be followed by manual application of erosion control and re-vegetation materials.

Purpose of Treatment: To lower potential for soil and/or water contamination

Treatment Effectiveness Monitoring: Site visits following storms to monitor treatment effectiveness and determine needs for treatment repair and/or maintenance.

Response Action – Erosion Control Treatment above Greenhorn Day Use Parking Area

General Description: Post wildfire runoff and erosion from burned hill-slope above the day use area parking lot and outhouse is likely to cause ongoing sediment deposition on the parking lot and clogging of culverts under the parking lot. Erosion control is recommended for approximately 14 acres of eroding hill-slope with moderate soil burn severity.

Locations: Greenhorn Day Use Area

Design/Construction Specifications: Treatment recommendations include seeding and erosion control (mulching with Woodstraw or wood shreds). Additionally, installation of log grade control structures is recommended to stabilize accelerated post wildfire erosion in a head-cutting gully. Local volunteers may be utilized to apply seed and erosion control materials manually.

Purpose of Treatment: To protect Forest Service Property, soil productivity and water quality. To prevent expansion of noxious weeds.

Treatment Effectiveness Monitoring: Site visits following storms to monitor treatment effectiveness and determine needs for treatment repair and/or maintenance.

Channel Response Actions

Response Action – Channel Debris Clearing – Baker and Warm Springs Creeks Historic Structure Protection

General Description: In both locations, there are large diameter trees blocking the channels near the residences. They are capturing burned woody debris. During high flows, this is likely to cause flooding at the houses. A footbridge crossing Baker Creek is also likely to trap debris, wash out and/or become entrained in flood flows.

Locations: Baker and Warm Springs Creeks Recreational Residences (Historic structures on NFS lands)

Design/Construction Specifications: Use a hand crew to remove one large downed tree, other debris and a footbridge. Notify the homeowners of increased risk and sandbagging to protect the historic structures.

Purpose of Treatment: To protect critical cultural/heritage resources.

Treatment Effectiveness Monitoring: Site visits following storms to monitor treatment effectiveness and determine needs for treatment repair and/or maintenance.

Road and Trail Response Actions

Response Action - Road Drainage Treatments

General Description: Several road stabilization treatments have been prescribed for Forest Service Roads located on the Ketchum Ranger District that will be directly impacted by post fire events. These treatments are for the transportation infrastructure and protect life, safety, property, and critical natural or cultural resources.

Purpose of Response Action: The watersheds burned in the Beaver Creek Fire will show the effects of the fire via increased runoff rates, erosion, sediment, and debris transport creating a future concern for roads, culverts, bridges, and channels along the drainage paths of the burned watersheds in that they may be plugged, overtopped or washed away more frequently than in its pre-fire condition. There is also increased danger to structures that remain in the flood plains due to the increased risk for debris slides and flooding.

Some of these effects have already been realized after having viewed the many debris flows across several places on all major roads within the fire which was caused by three substantial rain events that occurred during the assessment period.

These treatments identify roads and structures that will continue to be impacted by post-fire debris flows and flooding, assesses their current condition and vulnerability, and where necessary, recommends treatments to minimize the risks to public safety and protect the investment of the transportation system from the expected increased post-fire runoff. Loss of water control from drainage structures and channels can cause a safety and property loss risk.

Locations/Suitable Sites: The roads listed below were found to have or will have road drainage issues and at a minimum will require all or part of the treatments listed in section below. The roads are listed as a group as there are 64 miles of Forest Service roads within the fire perimeter. Note that the values listed below for the individual road numbers are for the portions of the road that were surveyed. It does not necessarily represent the entire length of the road. Road segments included are those located below or within burned slopes with moderate to high burn severity.

Baker Road FR #70162

- Culvert Installation: 9 @ 24"x32' 2 @ 48" x 35'
- Debris Racks: 2 Each
- Culvert Cleaning: 6 Each

- Culvert Resetting: 2 Each
- Ditch Cleaning: 6 Miles
- Road Reshape: 3 Each

East Fork Baker Road FR #70168 (Not All Surveyed)

- Debris Racks: 1 Each
- Apollo Creek Road FR #70269 (Not Surveyed)
- Reshape Road: 1 Each
- Ditch Cleaning: 1 Mile
- Rolling Dip: 1 Each
- Fill Slope Armoring 1 Each

Warm Springs Road FR #70227

- Culvert Installation: 6@ 24"x32', 2@ 18"x30', 1@36"x35', 6@24"x45',1@48"x35'
- Culvert Resetting: 4 Each
- Debris Racks: 3-24", 1-36", 1-48"
- Culvert Cleaning: 24 Each
- Ditch Cleaning: 10 Miles
- Reshape Road: 4 Each
- Channel Clearing: 2 Each
- Fill Slope Armoring: 16 Each

Green Horn Road FR #70117

- Culvert Resetting: 1 Each

Deer Creek Road FR #70097 (Not All Surveyed)

- Culvert Installation: 1@ 18"x 20', 1@18"x30'
- Culvert Cleaning: 12 Each
- Ditch Cleaning: 7 Miles
- Channel Clearing: 3 Each
- Reshape Road: 1 Each

Panther Gulch Road FR #70100 (Not Surveyed)

- Culvert Installation: 2 @ 24"x32'
- Culvert Resetting: 2 Each
- Debris Racks: 2 Each
- Culvert Cleaning: 6 Each
- Ditch Cleaning: 2 Miles
- Rolling Dip: 2 Each
- Reshape Road: 1 Each

Jolly Sailor Road FR #70099 (Not Surveyed)

- Culvert Installation: 2 @ 24"x32'
- Culvert Cleaning: 4 Each
- Ditch Cleaning: 1 Miles
- Rolling Dip: 1 Each

Wolf Tone Road FR #70102 (Not Surveyed)

- Culvert Removal: 2 Each

- Rolling Dip: 2 Each
- Ditch Cleaning: 1 Mile

North Fork Deer Creek Road FR #70103 (Not Surveyed)

- Culvert Installation: 1 @ 24"x32'
- Culvert Cleaning: 12 Each
- Reshape Road: 1 Each

Buttercup Road FR #70418

- Culvert Resetting: 1 Each
- Culvert Cleaning: 3 Each
- Fill Slope Armoring: 2 Each

Nebraska Creek Road FR #70418A (Not Surveyed)

- Culvert Installation: 2 @ 24"x32'
- Debris Racks: 4 Each
- Culvert Cleaning: 2 Each
- Ditch Cleaning: 1 Mile
- Rolling Dips: 2 Each

ML1 Roads Not Surveyed (14 miles to be treated)

- Reshape Road: 8 Each
- Waterbar: 50 Each

Design/Construction Specifications:

- Reshape Road - provide positive drainage to ditches and culverts by in-sloping or out-sloping as directed by the Engineer. Repair large ruts in the middle of the roadbed that channel water downgrade
- Rolling Drain Dips (with or without armor) – Construct rolling dips per Forest Service standards. Place rip rap across the roadway and on the fill slopes where potential runoff can occur if flow was to overtop the roadway from a plugged culvert or excessive runoff.
- Fill Slope Armoring – Install rip-rap along fill slopes along steep grades or channels. Place rip rap below the drain outlet to dissipate the energy from the flow. In areas of fill slope erosion that have occurred as a result of stream encroachment, armor fill slopes using riprap and geotextile material to secure slope and prevent fines from washing out of fill slope
- Ditch Cleaning – All drain ditches along the length of the roads shall have all existing silt and debris removed and either hauled away or spread out such that the material cannot reenter the drainage structure during a runoff event.
- Re-setting Existing Culverts – Remove and replace culverts in locations as directed by the Engineer. Culvert length and slope should approximate existing topography, 2% minimum slope with a recommended slope of 8% to maintain minimum velocities to help prevent plugging.
- Remove Culverts - Culverts will be removed and have the excavated hole laid back to match the surrounding stream banks in order to pass the increased flows and debris that are anticipated from future storm events.
- Culvert Cleaning – Remove any blockages from inlet, outlet and inside barrel. Straighten bent or replace inlets. Catchment-basins shall have all existing silt and debris

removed and either hauled away or spread out such that the material cannot reenter the drainage structure during a runoff event.

- Upsize Culverts - Pipe crossings were identified as being undersized due to the anticipated increase in flows from the burned watersheds above the crossings. These culverts will be replaced with larger culverts. Non-functioning culverts will also be removed and replaced.
- Debris Racks – Assemble wood or steel culvert inlet debris racks where indicated or found to be necessary on or above culvert locations. Debris racks design shall be such that it will capture the expected woody debris material that will come with the expected flows in each of the drainages.
- Channel Clearing – The removal of recent loose debris that is directing water towards the road or bridge structure that will cause severe scour during flood events.

Treatment Effectiveness Monitoring: See specification for “Storm Inspection and Response”

Response Action - Bridge Stabilization

General Description: These bridges are undersized for expected increase in flows from the burned watersheds above the crossings. Threats to the bridges include clogging by post wildfire debris, overtopping, erosion of road surface and erosion of material around the bridge abutments and failure of the bridges. Failure of the bridge would result in loss of USFS property, loss of access/egress and could pose a threat to the safety of road users.

Response Action Locations: Wolftone Bridge and Warm Springs Bridges #7 and #8.

Design/Construction Specifications: Armoring of bridge abutments is needed to lower the risk of severe damage or loss of these bridges. Contract specifications shall conform to Forest Service Supplements and the designated sections in the *FP03-Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects*.

Purpose of Treatment: Reduce the risk of damage to the bridge, bridge failure and subsequent threats to life and safety.

Treatment Effectiveness Monitoring: Reinforcement actions will be designed to increase the resilience of the structures to accommodate increased in flows and debris. Check the bridges following precipitation events to monitor treatment effectiveness and identify needs for treatment repair or maintenance.

Response Action - Road Storm Inspection and Response (Storm Patrol)

General Description: Roads within the Beaver Creek Fire contain drainage structures that cross streams located in watersheds that have areas of a large percentage of high burn severity. These streams now have the potential for increased runoff and debris flows. The predicted increased flows are a direct cause from the lack of vegetation to slow down the water flow and/or from hydrophobic soil conditions that can prevent surface water infiltration. These flow increases pose a threat to the existing crossings which may result in plugging culverts or exceeding their maximum flow capacity. If these flows plug drainage structures the result could be massive erosion and debris torrents further down the drainage due to the failure of the fill slope.

Also, there is an immediate and future threat to travelers along these roads within the burned area due to the increased potential for rolling and falling rock from burned slopes and increased potential for flash floods and mudflows. With the loss of vegetation normal storm frequencies and magnitudes can more easily initiate rill and gully erosion on the slopes and it is likely that this runoff will cover the roads or cause washouts. These events make for hazardous access along steep slopes and put the safety of users at risk.

Purpose of Response Action: The purpose of storm inspection and response 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 flow conveyance structures across roads in order to provide safe access across FS lands.

The patrols are used to identify those road problems such as plugged culverts and washed out roads and to clear, clean, and/or block those roads that are or have received damage. The storm patrollers shall have access to at least a backhoe and dump truck that can be used when a drainage culvert is plugged or soon to be plugged and to repair any road receiving severe surface erosion.

Engineering and District personnel will survey the roads within the fire perimeter after high-intensity summer thunderstorms in 2013 and 2014. Survey will inspect road surface condition, ditch erosion, rolling drain dip failure and culverts/inlet basins for capacity to accommodate runoff flows.

Location/Suitable Sites: The patrols will focus on the Forest Service roads that receive the most traffic and are of more value to the transportation system. Due to the vast distance between each of the roads to be patrolled the team could also check where the highest rain intensities occurred when a storm passes through the fire area and concentrate their efforts on the areas receiving the most precipitation.

Design/Construction Specifications:

- FS personnel will direct the work.
- Immediately upon receiving heavy rain and Spring snowmelt the USFS will send out patrols to identify road hazard conditions – obstructions such as rocks, sediment, washouts – and plugged culverts so the problems can be corrected before they worsen or jeopardize motor vehicle users.
- The road patrols shall bring in heavy equipment necessary to mechanically remove any obstructions from the roads and culvert inlets and catch basins where necessary.
- All excess material and debris removed from the drainage system shall be placed outside of flood prone areas where it cannot re-enter stream channels.

Describe Treatment Effectiveness Monitoring: Monitor the storm-patrol response time to ensure objectives are being met. Identify the type of storm event that mobilizes material.

Response Action – Trail Drainage Treatments

General Description: Sections of trails routed through or adjacent to steep burned areas (both moderate and high soil burn severity) area at high risk. Treatments include installing rolling dips, water-bars and rock water bars. Treatments are needed to provide sustainability of the trail and to prevent off-site impacts should the trails erode or fail.

Location: The trails are located primarily through areas mapped as moderate soil burn severity, approximately 90 trail miles. With the expected watershed response, these routes will have varying levels of damage depending on the localized precipitation. The trail drainage treatment and storm patrols are designed to work in concert to maintain the sustainability of the routes. While not all 90 miles will actually be treated, at some point the entire length of the trails will be traveled to reach the segments needing drainage work. A rapid assessment was completed during the assessment to evaluate of trail conditions. However, this treatment used the following criteria to determine suitable sites. Each trail segment listed for treatment would be:

1. Within or below moderate and high-burn severity areas
2. Have a sustained grade through burned areas that lacks adequate drainage
3. Has the potential to deliver sediment to streams
4. Consists of previous drainage structures that were damaged by the fire
5. Has a stream crossing with diversion potential

Design/Construction Specifications: According to USFS Trails Handbook 2309.18.

Installation should be designed to last no more than 3 years. Permanent structures are not part of this treatment. If safety risks (e.g. hazard trees) cannot be mitigated for work crews, work will be delayed until threat is reduced or stabilized.

1. Install drainage feature depending on steepness of trail (18 per mile) in areas of moderate or high severity. Focus on sections of trail that have continuous gradient for a length of greater than 50 feet and are either in-sloped (cupped) or show evidence of routing water (rills, gullies).
2. Hazards within or along the trail route that restrict efficient and safe access to work sites will be mitigated (rocks, trees).
3. Clean existing water bars and drainage structures.

Purpose of Treatment: This treatment is designed to stabilize trails lacking adequate drainage features for anticipated increases in runoff. The stabilization methods may vary by site but are designed to reduce trail erosion or damage. The BAER Team considered this treatment to be the minimum necessary to achieve a reduction in risk to the following critical values:

1. Trail infrastructure
2. Soil productivity
3. Hydrologic function
4. Safety of trail users

Treatment Effectiveness Monitoring: The sections of trail improved during this treatment will be inspected after implementation and in 2014 to ensure that drainage features are functioning.

Protection/Safety Response Actions

Response Action - Road and Trail Warning Signs

General Description: This treatment is for installation of “Burned Area” warning signs, highway warning signs, road closure signs, and Type 2 object markers.

Purpose of Response Action:

- The purpose of “Burned Area Warning Signs” is to reduce the risks to human life and safety by warning motorists of existing threats while traveling the authorized routes within the areas susceptible to flooding, debris flows, hazards trees, and all other risks attributable to post fire events on the landscape.

- The purpose of highway warning signs is to replace the existing signs that were burned during the fire. These signs are necessary to warn travelers of hazardous road conditions and features such as curve signs and falling rocks.
- Several carsonite posts used typically to mark locations of culverts and any other potential structures within the roads shoulder were burned during the fire. These carsonite posts not only alert the motorist where not to pull over but are extremely valuable in finding plugged culverts when they become completely buried. Installing these posts will aid in helping find culverts when crews are doing patrols for storm induced road hazards.
- Road closure signs are needed to alert the travelers of closed roads which will be necessary to protect all users from driving into areas that have been determined to be more susceptible to hazards caused by the fire.

Location/Suitable Sites: Burned Area warning signs will be located at all points of entries by use of forest system roads into the burned areas. These locations are as follows:

- Beginning of the fire perimeter along Baker Creek Road – 1 each
- Start of the East Fork Baker Creek Road – 1 each
- Beginning of the fire perimeter on either end of Warm Springs Road – 2 each
- Beginning of the fire perimeter along Deer Creek Road – 1 each
- Beginning of the fire perimeter along Willow Creek Road – 1 each

Within the burned area, warning signs will primarily be on the Warm Springs Road. From the field investigations it is estimated that four signs will be needed to replace those that were burned and four more signs warning of falling rocks.

The carsonite posts will be located on most of the roads within all five of the major drainages within the fire. It is estimated that 140 posts is required.

The four closure and eight barricade marker signs will be attached to the steel post gates located on Baker Creek, Warm Springs, and Deer Creek roads.

Design/Construction Specifications: Burned Area warning signs along the roads shall measure, at a minimum, 30 inch by 36 inch and consist of 0.08" aluminum, sheeted in high intensity yellow with black letters, which is shown in the photo below. The "BURNED AREA" lettering shall be a minimum of 5 inches in height and all remaining lettering shall not be less than 3.5 inches in height.

Traffic Warning, Road Closure, and Barricade Markers Signs shall conform to the M.U.T.C.D. standards and shall be installed per Federal Highway Safety Standards.

Carsonite posts shall be white and contain a self-adhesive solid yellow, diamond grade, Type 2 Object marker and be installed per Forest Service standards.

Treatment Effectiveness Monitoring: All locations of signs shall be directed by the Engineer and checked to ensure they have been installed per MUTCD or Forest Service standards and will be periodically checked to ensure they are still in place.

Response Action - Administrative Closures at Campsites to Lower Potential Threats to Life and/or Safety

General Description: Administrative Closures at 80 Dispersed Campsites - Move existing barrier rocks that currently define parking spurs at 80 designated dispersed campsites and place them at the junction of the spur and main road to close designated dispersed campsites to 4-wheeled vehicle access. In addition, the current tent and site number decals on the fiberglass post that identify the campsite will be covered with “Due to Unsafe Conditions AREA CLOSED For Public Protection From Burned Area Hazards” decals. Burned fiberglass marking posts will be removed and replaced with a new post and the decal described above.

Locations:

- 16 designated dispersed campsites in the Deer Creek drainage.
- 26 designated dispersed campsites in the Warm Springs Creek drainage.
- 38 designated dispersed campsites in the Baker Creek drainage.

Purpose of Response Action: This treatment is expected to reduce risks to human life and safety from floods, debris flows, and hazard trees by discouraging overnight dispersed camping in drainages within and downstream of the burned area, yet allow for public access when conditions stabilize enough to allow for day-uses such as mushroom and firewood gathering, sightseeing, hunting, fishing, hiking, etc. from the drainage’s main road. Removing burned fiberglass posts will clean-up potentially hazardous waste from NF lands.

Design and Construction Specifications:

- Move sufficient numbers of existing barrier rocks in designated dispersed campsites that have been identified as having an unacceptable risk for future flood and debris flow and/or from hazard trees to effectively close access to each campsite by 4-wheeled vehicles.
- Cover surviving fiberglass marker post’s tent symbol and campsite number decals with the decal described above. Remove and replace burned fiberglass marking posts with a new post and apply the decal described above to the post.

Treatment Effectiveness Monitoring: District and SO personnel will monitor or check barriers and signs periodically and after storm events to ensure that they continue to be effective. Once a determination is made that high flood, debris flow, and hazard tree risks have abated, designated dispersed camping can be allowed again in these sites by moving the barrier rocks back to their original locations and covering the “...AREA CLOSED...” decals with new tent and unit number decals.

Response Action - Administrative Closures of Roads and Trails to Lower Potential Threats to Life and/or Safety

General Description: On roads, this treatment calls for the installation of steel post gates to close roads when necessary for public safety. On trails, closure signs will be installed.

Closure Locations:

Roads - Locations for the steel post gates are:

- NFSR 70162 - Baker Creek - South side of the intersection of Baker Creek and East Fork Baker Creek roads
- NFSR 70227 - Warm Springs - East side of parking area on top of Dollarhide Summit
- NFSR 70227
- Warm Springs - West side of the intersection of Warm Springs and Placer Creek roads

- NFSR 70097 - Deer Creek West side of the intersection of Deer Creek and Wolftone Creek roads

Trails: Indefinite closure of the following trails until hazards are removed and trails are stabilized:

- Kinsey Creek Trail #319
- Wolftone Creek Trail
- Curran Gulch Trail #160
- Deer Creek Trail #158
- Curran/Kinsey Connector #318
- Howards Trail #331
- N. FK Deer Creek Trail #157
- Lick Creek Trail #218
- Imperial Gulch Trail #315
- Greenhorn Gulch Trail #156
- Placer Creek Trail #141
- S. FK. Warm Springs Trail #151
- Castle Creek Trail #140
- Osberg Ridgeline Trail #147
- Alden Gulch Trail #144
- Middle FK of South FK Warm Springs Trail #199

Purpose of Response Action: The primary reason for installing the gates is for public safety during periods of expected moderate to high rainfall events. In the event severe stormy weather is predicted over the Beaver Creek Fire area, a line officer may decide there is a need to close the roads that would be affected by the expected run off. A gate would be necessary in preventing the public from accessing the area of the forest by vehicle during these severe weather events.

Design/Construction Specifications: The gates shall be constructed according to the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03 (Similar to the photo below). All signing associated with the gate installation shall follow Forest Service Engineering Manual 7100-15 and the Federal Highways Manual of Uniform Traffic Control Devices (MUTCD). This includes typical gate barricade markers and object markers and any signs that may be installed with the gate such as a road closed sign.

All gates shall be able to be secured in the open position so as not to be a hazard to traffic. Cables, chains, or single-wire barriers shall never be used across any roadway because they are not readily visible to road users. Travel management signs may be used on gates to display access and travel management restrictions and closures. Refer to the Sign Installation Guide for additional information about the required gate signs.

Describe Treatment Effectiveness Monitoring: All locations of signs shall be directed by the Engineer and checked to ensure they have been installed per MUTCD or Forest Service standards and will be periodically checked by the district to ensure they are still in place.

Response Action – Hazardous Debris Removal – Greenhorn Guard Station and Day Use Area

General Description: Removal of contaminated or hazardous material created or exposed by the fire is recommended. At the Greenhorn Day Use Area and Trailhead, two out of three trail bridges are burned. Debris from the burned bridges is composed of wood, steel spikes and other sharp objects. This hazardous debris presents a safety threat to forest workers and area users. At the Greenhorn Guard Station, burned debris includes physical and chemical hazards that present a safety threat to forest workers. Additionally, overland flow is likely to wash some of these materials off site. Removal of the hazardous debris is recommended.

Locations: Greenhorn Day Use Area and Greenhorn Guard Station

Design/Construction Specifications: Review the Burned Area Emergency Response Treatments Catalog December 2006 for additional information regarding hazardous debris removal.

Purpose of Treatment: To lower risk for impacts to safety of Forest Users and Workers

Treatment Effectiveness Monitoring: None required

Response Action – Protective Barrier Installation – Forest Service Facility Protection

Locations: Greenhorn Guard Station

Design/Construction Specifications: Install approximately 60 sand bags to protect outhouse from flooding and debris.

Purpose of Treatment: To protect Forest Service Property

Treatment Effectiveness Monitoring: None required

Response Action - Dollarhide Snotel Site Protection

General Description: This work would provide sediment removal from the site and access road as well as hazard tree removal from the site only. Sediment would be removed on an as needed basis. Hazard trees would be removed by a hand crew prior to re-establishment of equipment at the site. The site is located on a steep slope (50-60%) of moderate/high burn severity and sediment delivery and falling trees are very likely to damage equipment, block access, and present a safety risk to workers at the site. The Dollarhide Snotel site provides valuable climatologic and water supply data, including data used by the Forest Service Avalanche Center, and is a key high elevation site in the state.

Purpose of Response Action: This site is on a 50-60% slope and is a constructed landing with a cut and fill slope. The access road is a cut and fill road that crosses the slope. Up-slope erosion and sediment transport will deposit on the flat surface of the site landing where the Snotel site equipment is located. The value at this site is the property and equipment (road, instruments, station infrastructure) and the safety of workers at the site. The threat to this site is from sediment runoff onto the site landing and the access road and from burned hazard trees falling onto equipment at the site, blocking access to the road, and as a threat to workers at the site. The risk would be reduced by removing sediment from the cut slope side of the road and site landing on an as needed basis. The risk to safety of the workers would be mitigated by removing hazard trees within 100 feet of the site landing itself.

Location: The location of the site is just north of the Ketchum/Featherville Road (FR 70227) ¾ mile northeast of Dollarhide Summit. The access road leaves the 227 road at the last switchback east of the summit and crosses a saddle into the Parker Gulch drainage.

Design and Construction Specifications:

Cut hazard trees along access road. Cut hazard trees or any tree that could potentially fall onto site landing and damage equipment, particularly those upslope of the site.

For sediment removal: remove accumulated material from cut slope side of landing and road. In particular, clean cut slope adjacent to equipment at site landing to reduce the impacts to the equipment and/or the snowpack data collection effort

Response Action – Extended Emergency and Implementation Coordination

General Description: Two major areas of ongoing responsibility are oversight/ management of BAER implementation projects and ongoing coordination with external partners and affected parties. Ongoing communication and coordination with other federal, state, and local agencies with jurisdiction over lands where life and property are at risk from post-fire conditions is needed. There was a very high level of public involvement and interagency coordination initiated during the Beaver Creek Fire suppression efforts. This interest continued into the BAER assessment and there will be a need for maintaining a high level of coordination during implementation of emergency stabilization treatment recommendations that are approved for NFS lands. Actions include but are not limited to cooperating with other agencies on hazard notification systems, permitting the siting of rain gages and soil moisture instruments to monitor conditions within the burn in support of National Weather Service forecasts, and exchanging information and coordinating the BAER implementation plan as needed when subsequent recovery plans are developed by other agencies. This initial request is to fund a primary coordinator to facilitate coordination of the Forest Service BAER activities with the cooperating partners implement EMS (Emergency Management Services) for other jurisdictions. During the next 3-5 years it is critical that appropriate agencies maintain due diligence and continue to inform the public of the potential hazards resulting from post-fire watershed response.

I. Monitoring Narrative:

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

Beyond the implementation monitoring for each treatment, the extent of proposed effectiveness monitoring is incorporated into the storm patrol and administrative closure treatments.

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim # 1

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands		All Total \$
			# of Units	BAER \$		# of units	Fed \$	Non Fed \$
A. Land Treatments								
Aerial Mulch (Ag. Straw)	acres	\$1,330	1455	\$1,935,150	\$0		\$0	\$1,935,150
Aerial Seed (with mulch)	acres	\$140	1455	\$203,729	\$0			\$203,729
Aerial Seed (shrubs)	acres	\$206	10883	\$0	\$0			\$0
Nox. Weeds- EDRR	acres	\$14	3,364	\$47,100	\$0		\$0	\$47,100
Erosion Control -Buttercup	each	\$3,757	1	\$3,757				
Erosion Control - Greenhorn Day Us	each	\$33,284	1	\$33,284				
Aerial Seed (grass)	each	\$114	5,936	\$676,704	\$0			
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0
Subtotal Land Treatments				\$2,899,724	\$0		\$0	\$2,185,979
B. Channel Treatments								
Channel Debris Clearing - Baker and	each	3,780	1	\$3,780	\$0		\$0	\$3,780
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0
Subtotal Channel Treatments				\$3,780	\$0		\$0	\$3,780
C. Road and Trails								
Road Drainage	miles	\$6,206	64	\$397,184	\$0		\$0	\$397,184
Road Storm Insp. And Response		\$3,657	8	\$29,256				
Trail Storm Proofing, Insp. and Respo	miles	\$1,519	90	\$136,753	\$0		\$0	\$136,753
Fairfield RD Trails				\$7,680				
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0
Subtotal Road and Trails				\$570,873	\$0		\$0	\$533,937
D. Protection/Safety								
Site Protection - Greenhorn Guard St	each	\$990	1	\$990	\$0		\$0	\$990
Disp. Campsite Admin. Closure	each	\$224	80	\$17,883	\$0		\$0	\$17,883
Hazardous Material Removal	days	\$220	10	\$2,200	\$0			
Road Warning Signs	each	\$368	26	\$9,575	\$0			
Road Closure Gates	each	\$5,049	4	\$20,196	\$0			
Trail and Rec.Site Warning Signs	each	\$224	80	\$17,951	\$0			
Snotel Site	each	\$3,705	1	\$3,705	\$0			
				\$0	\$0			
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0
Subtotal Protection/Safety				\$72,500	\$0		\$0	\$18,873
E. BAER Evaluation								
Initial Assessment	report		1		\$170,850		\$0	\$0
<i>Insert new items above this line!</i>				---	\$0		\$0	\$0
Subtotal Evaluation				---	\$170,850		\$0	\$0
F. Monitoring								
Interagency Coordinator and Impleme	days	\$470	30	\$14,100			\$0	\$14,100
<i>Insert new items above this line!</i>				\$0	\$0		\$0	\$0
Subtotal Monitoring				\$14,100	\$0		\$0	\$14,100
G. Totals				\$3,560,978	\$170,850		\$0	\$0
Previously approved				\$2,884,274				
Total for this request				\$676,704				

PART VII - APPROVALS

- | | | |
|----|--|---------------------------------|
| 1. | <u>/s/ Rebecca S. Nourse</u>
Forest Supervisor (signature) | <u>October 24, 2013</u>
Date |
| 2. | <u>/s/ Chris Iverson(for)</u>
Regional Forester (signature) | <u>October 24, 2013</u>
Date |