USDA-FOREST SERVICE

Tom Basin FS-2500-8 (6/06)
Date of Report: 10/27/2011 edits in blue

BURNED-AREA REPORT
(Reference FSH 2509.13)
PART I - TYPE OF REQUEST

A. Type of Report
[x] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action
[] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
[X] 2. Interim Report # 2
[X] 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: Tom Basin

B. Fire Number: NV-HTF-0388

C. State: NV

D. County: Humboldt

E. Region: 4

F. Forest: Humboldt-Toiyabe

G. District: Santa Rosa RD

H. Fire Incident Job Code: P4GHQ6

I. Date Fire Started: 09/30//2011

J. Date Fire Contained: 10/07/2011

K. Suppression Cost: $335,000 Suppression cost are low in comparision to request for funds, A large storm rained the fire out.

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): less than 0.1
2. Fireline seeded (miles): 0
3. Other (identify):

M. Watershed Number: 106401090601 (Indian Creek), 106401090502 (Picket-Martin Creek), 106401090503 (Round Coral-Martin Creek)

N. Total Acres Burned: NFS Acres (4858) Other Federal (10) State (0) Private (267)

O. Vegetation Types: Aspen, mohogany; Wyoming sagebrush, mountain sagebrush, low sagebrush

P. Dominant Soils: The major soils within the fire parameter are Argic Pachic Cryorolls, loamy skeletal mix (1,616 acres); Lithic Argixerolls, clayey, montmorillonitic, frigid (1,279 acres); Argic Lithic Cryoborolls, loamy-skeletal, mixed (1,224 acres).

Q. Geologic Types: The geology of the burned area is Tertiary Rhyolitic and Dacitic volcanic rocks, Tertiary Granodiorite, and Tertiary and Upper Cretacious Basaltic and Andesitic volcanic rocks.

R. Miles of Stream Channels by Order or Class: Perennial stream (5.7) mi Intermittent stream (11.1) mi

S. Transportation System: Trails: 0 miles Roads: 13.57 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 682 acres (33%, low); 2,769 acres (54%, moderate); 54 acres (1%, high); 620 acres (12%, unburned)

B. Water-Repellent Soil (acres): approximately acres 716 acres

C. Soil Erosion Hazard Rating (acres)

Table 1. Soil Erosion Hazard Rating

Erosion Hazard	Pre-Fire	Post-Fire (function of burn severity)				Change
		Low	Moderate	High	Total	
Low	2,889	1,191	0	0	1,191	-1,698
Moderate	1,958	858	2,740	30	3,628	+1,670
High	290	260	29	29	318	+29

D. Erosion Potential: 11.4 tons per acre per year for two years after the fire

E. Sediment Potential: 5,600 cubic yards per square mile for the first year after the fire; 3,200 cubic yards per square mile the second year

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 3-5

B. Design Chance of Success, (percent): 80

C. Equivalent Design Recurrence Interval, (years): 2,5,10,50 (see table at end of section)

D. Design Storm Duration, (hours): 24

E. Design Storm Magnitude, (inches): see table below

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

G. Estimated Reduction in Infiltration, (percent): not calculate

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

Table 2. Estimated Changes in Peak Runoff Rates for 24 hour duration storm evaluation

Recurrence Interval (yrs)	2			5			10			50		
Design Storm (in)	1.75			2.19			2.55			3.47		
Drainage	Q pre cfs	Q post cfs	% change	Q pre cfs	Q post cfs	% change	Q pre cfs	Q post cfs	% change	Q pre cfs	Q post cfs	% change
Tom Basin	4.1	22.6	452%	22.48	69.46	209%	53.54	123.9	131%	186.3	313.5	68%
Unnamed	2.5	9.5	281%	16.35	39.66	143%	41.79	78.41	88%	152.2	220.2	45%
Left Fk Buttermilk	0.5	35.3	7753%	2.66	81.62	2968%	8.39	130.0	1449%	55.19	283.7	414%
Buttermilk	11.5	49.5	330%	42.18	109.9	161%	80.85	171.8	112%	221.5	364.5	65%
Bullion	6.4	25.7	299%	25.25	58.71	133%	48.34	91.59	89%	128.1	191.6	50%
Dry	1.1	51.7	4514%	5.87	117.3	1899%	17.48	185.9	964%	93.71	405.2	332%
Spring City	2.0	3.4	74%	11.42	20.96	84%	38.77	61.37	58%	203.3	259.8	28%
Picket Corral	0.3	4.9	1494%	2.24	19.76	782%	7.63	38.85	409%	71.36	108.5	52%
W Fk Round Corral	0.4	4.4	1146%	2.58	26.06	910%	8.83	64.05	625%	82.98	227.9	175%
Round Corral	4.1	16.5	301%	24.39	87.57	259%	69.4	197.77	185%	286.46	647.6	126%

PART V - SUMMARY OF ANALYSIS

This request represents an update of costs required to meet the forest specifications for reducing unacceptable risks to BAER Values. Updates costs are highlighted in PART VI.

A. Describe Critical Values/Resources and Threats: The Tom Basin Fire burned the south facing slope slightly west of Buttermilk meadow and east of coal spring in the north end. East of Tom Basin and west of Spring City on the southern end. South of Recanzone spring in the north and northwest of Spring City on the southern end These drainages have the potential to produce small debris flows during large storm events.

Life: The burned conditions increase the potential for accelerated erosion and sediment transport with ensuing floods, debris flows, and rock fall which increase the risk to the life and safety of recreationists visiting the area. The burned area receives a relatively high volume of recreation use by people using the existing motorized routes. The routes are most popular during the late summer and fall big game hunting seasons. The area is also rich with historic mining sites that draw visitors to the area, although less frequent than other forest users. No immediate imminent threats to life from the fire were identified however several threats to public safety which could result in serious injury or death were identified. See discussion in the Public Safety Section.

Public Safety: The severity of burn in some watersheds, combined with road location, high possibility of flooding, mud/debris flow, and falling rocks has increased the risk to road users and the potential for life threatening situations to occur. Slopes have also been made unstable due to severity of burn and loss of vegetation. Increased flows in drainage channels will likely cause flooding of roads especially at the low water crossings. Areas with large source areas of steep, consistent slopes have very little roughness to slow runoff and where located above confined drainages present a risk to safety. Areas with those conditions include the upper portions of Dry Creek, Buttermilk Creek, and the Left Fork of Buttermilk Creek (west of Buttermilk Ck) where steep (60%+), long (1500ft +) slopes with low to moderate burn severity are the most likely to produce runoff events.

Adits and Mine Shafts
The fire exposed 5 abandoned mine features, Now that the vegetation is completely burned off they are clearly visible from the main travel road in the watershed and readily accessible by an existing Jeep trail. Mitigation of these hazards is necessary due to the public safety hazard they present as a result of their exposure by the fire. There are other waste rock dumps present in the vicinity, but they relate to underground workings already caved from natural erosive processes.

Property:
Potential Threats to Travel Routes The burned conditions within the watersheds create concern for stability of the travel routes. There is an increased potential for roads located in valley bottoms and stream crossings to be blocked, overtopped, or washed away. Potential threats include accelerated erosion and increased overland flows that can result in failures of road segments within the burned area.

Threats to Cultural Resources The fire impacted several known historic structures along FS Road 471. As well, a resulting loss of vegetation exposed features not noted previously in the Bullion mining district, part of which is on private land. Examination of the structures along FS Road 471 and in the Bullion area resulted in the recommendation of stabilization and protection for one of the structures. This structure is located at UTM coordinates 460768mE/4604535mN on the Spring City Quadrangle just south of FS road 472 leading to Spring City, in a highly visible location along FS road 471 near the junction of the road to the historic mining town (now considered a ruin).

Potential Loss of Soil Quality Soils in the burned area are derived from mixed geology, consisting of volcanic and granitic parent material. The dominant soils have inherently moderate-to-low surface erosion characteristics. In moderate soil burn severity areas the moderate to high fire intensity completely consumed the overstory vegetation canopy and the majority of the effective ground cover that dissipates rainfall and regulates overland flow. The shallow soil cover layer and surface soils host the microorganisms that process organic materials making nutrients available for plant uptake. Even with average precipitation, accelerated erosion rates combined with higher surface runoff efficiencies may move the exposed soil and the thin veneer of nutrient-rich ash off-site, thereby decreasing soil quality over the long term. It is predicted that vegetative succession will provide roughly 50 percent shrub canopy and grass/forb ground cover within two to five years. Where the fire burned at moderate to high fire intensity there was total canopy consumption and 80 to 100 percent mortality of the pre-fire bitterbrush and sagebrush stands. Prefire and in unburned areas within the fire perimeter, soil cover for most of these areas is primarily bunch grasses, and leaf litter creating a variable duff layer less than 1 inch deep. The time frame for desired vegetation communities to effectively restore the soil-hydrologic functions in moderate-high intensity and moderate soil burn severity may exceed 5 years.

Soil quality also has a moderate to high risk of being impacted in the burned area due to the spread of noxious weeds and invasive plant species from nearby existing populations, and possibly the introduction of undesirable vegetation species as a result of fire suppression efforts. Field reviews by the Forest Service BAER team identified a moderate to high risk for expansion of existing medusahead, leafy spurge, and Russian knapweed populations depending on burn severity, proximity of existing population, percent of area occupied by the noxious weed or invasive and the expected recovery of the native plant community after the fire. There is potential for noxious weed spread from known populations adjacent to fire via access routes and seeds brought into the area by uncleaned fire suppression equipment, suppression activities and expected OHV use.

Potential Loss to Ecosystem Integrity Ecosystem integrity has a high risk of being impacted in the burned area due to the spread of noxious weeds and invasive plant species from nearby existing populations, and possibly the introduction of undesirable vegetation species as a result of fire suppression efforts. Existing plot data within the fire area indicated a 3 to 5 percent existence of cheatgrass within the existing plant native community. There are also isolated populations of weeds that are more likely to be transported into the site by wind, animals, or OHV and establish in the open bare ground conditions that the fire has created. There is a concern that these weeds will readily outcompete the natives. Since cheatgrass expands so quickly after a fire, much of this area is susceptible to cheatgrass conversion. Cheatgrass conversion could limit the watershed function to the top few inches of soil, increase the future fire frequency, create a pocket population that could invade adjacent areas and limit the site capability of the area to produce forage and shelter for wildlife.

Potential Degradation of Stream Function Stream channels within the fire perimeter are steep 1st and 2nd order streams with high gradient slopes immediately adjacent.The smaller channels also had significant amounts of riparian vegetation consumed by the fire. The fire increases the likelihood of increased runoff and decreases the ability of the stream channel to pass larger flows without degradation. Increased flows or elevated debris and soil transport could impair stream function through downcutting channels or sediment deposition.

Roads The watersheds burned in the Tom Basin Fire will show the effects of the fire via increased runoff rates, erosion, sediment, and debris transport. This creates a future concern for roads and channels along the drainage paths of the burned watersheds in that they may be plugged, overtopped or washed away more frequently than experienced when the watershed was in its pre-fire condition. The risk associated with these structures is the increased risk for debris slides and flooding.

This report identifies roads and structures, assess their current condition and vulnerability, and where necessary, recommend treatments to minimize the risks to public safety and the potential for increased post-fire runoff.

The reconnaissance of the roads during the field investigations found several issues pertaining to road stabilization and public safety. Issues associated with road system reconnaissance, include issues pertaining to falling rock potential, creek crossings, and road drainage. The general issues just mentioned are further described along with the roads they are associated with, in Table 3.

Table 3. List of Roads with Post Fire Issues Identified During Field Investigations

FOREST ROAD NUMBER AND NAME	ISSUES	HUC 6 WATERSHED
50471 – Buttermilk Road	• Multiple water crossings • Road in flood plain • Rock fall hazard • Possible washouts • Increased sedimentation • Gated Seasonal Closure • Road has multiple switchbacks on steep hillside and is prone to side hill cut failures	Indian Creek Round Corral Creek-Martin Creek
50471A – Buttermilk Spur A	• Road connects to a road not on MVUM to connect to 50684B • Low water crossing	Indian Creek
50471B – Buttermilk Spur B	• Install water bars/drain dips heading up the road	Round Corral Creek-Martin Creek
50472 - Spring City Road	• Steep grade without water bars • 2nd section of the Road (Jeep Trail) goes up the stream channel	Indian Creek
50684 – Buttermilk Creek	• Improve the low water crossing by importing some fill on the south end of the crossing to build a bank	Indian Creek
50684A – Buttermilk Creek Spur A	• Low water crossing • Runs along the big gully	Indian Creek
50684B – Buttermilk Creek Spur B	• Road across the flatter country	Indian Creek

50130 – Round Corral Road	• High elevation with steep grades • Clean and install leadoff ditches • Water bars on the steeper slopes	Round Corral Creek-Martin Creek Picket Corral Creek-Martin Creek
50130A – Round Corral Spur A	• Road along meadow • Steeper grades in short durations	Round Corral Creek-Martin Creek
50130B – Round Corral Spur B	• Steep road grades • Consider water bars to get water off of the road	Round Corral Creek-Martin Creek
50686 – Tom Basin Road	• Road out through flatter country	Indian Creek

Most of these issues are typical of what is found on roads within the fire perimeters. The issues pertaining to most of the roads in *Table-1 List of roads with Post Fire issues identified during field investigations* are a result of the roads template and location. In unburned conditions these roads do not require large amounts of maintenance or are not prone to catastrophic failures. However, in the moderately or intensely burn watersheds within the fire it is expected the roads will not be able to route or shed the addition water caused from changes in timing and increases in hydrophobic soils, they will be more prone to slides and cut failures because of the lack of vegetation and rock slides will be more prevalent because the vegetation holding rocks in place was fully consumed.

The road template of the Buttermilk Road is out sloped with multiple creek crossings. The alignment is constructed on rocky mountain terrain, in drainage channels that have moderately wide channel bottoms with steep side channels. The remainder of the roads, with in the fire perimeter, are roads that have been driven in and don't appear to be constructed. Roads that are out sloped are designed to allow for water to sheet flow across the road however one of the major issues with maintaining these roads is that as the road is graded the operators leave a small berm of unusable material on the downhill side of the road. These berms capture the water and force it down the road until there is a lead off ditch or drain dip, instead of allowing the water to flow evenly over the hillside, the water is concentrated at the lead off ditch and begins to form a gully. Roads with side slopes ranging from 30º to 80º and have large drainage channels intersecting the roadway are at an increased risk for erosion and loss of water control. These steep grades are able to deliver high erosive runoffs which can carry large amounts of sediment and debris in a short time span.

The combination of runoff and debris has the risk of plugging, blocking, and destroying engineering drainage structures. With the landscape now burned, the runoff flows will be greater in intensity and more debris is available for transport above these crossings, increasing the risk for engineering drainage structure failure.

EMERGENCY DETERMINATION(S)

Based on the findings from the soil resource analysis, the post-fire effects from the Tom Basin Fire raise there is a moderate concern of fire effects resulting in emergency watershed conditions, but not widespread across the burned area. In reference to the Values at Risk, any increase in erosion is not at a scale that would substantially impact soil quality or watershed processes under average climate conditions. However, should a long duration greater intensity storm event occur over the burned area, the absence of intercepting vegetation canopy and soil cover has increased the potential for mass erosion, debris flows, or landslide events over the next 3 to 5 years. Impacts that decrease soil quality are primarily through two mechanisms: 1) increased erosion moving the exposed soil and nutrient rich ash off-site; and 2) burned areas are more susceptible to spread of noxious weeds and invasive plant species. Increased overland flow from burned hillslopes with accelerated soil erosion, sedimentation, and increased streamflow response is expected at decreasing rates for the next two to five years after the fire, until vegetation has sufficiently recovered to restore the surface soil-hydrologic function and processes of the watersheds that burned at moderate and high severity.

The completely burned hillslopes from ridgetop to valley bottom at moderate soil burn severity, primarily in the steep headwater source areas of the Dry Creek and Buttermilk drainages, lend to a moderate risk for accelerated erosion and sediment, including debris flows under high intensity precipitation events. The effects of the burned area on soil resources could result in indirect impacts to public safety, the existing travel routes, and archeological sites. There is a moderate potential for increased rate of spread of noxious weeds and invasive species that could result in a long term decrease in soil quality.

B. Emergency Treatment Objectives:
Reduce risks to life and property, stablize and minimize where and when possible loss or distruction of property. Maintain soil productivity and water quality while reducing impacts from accerlerated erosion

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land __ % Channel __ % Roads/Trails 80 % Protection/Safety __ %

D. Probability of Treatment Success:

	Years after Treatment		
	1	3	5
Land			
Channel			
Roads/Trails	80	85	95
Protection/Safety			

E. Cost of No-Action (Including Loss): Refer to VAR spreadsheet for items E and F

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:
[x] Hydrology [x] Soils [ ] Geology [x] Range [ ] Forestry [ ] Wildlife
[ ] Fire Mgmt. [x] Engineering [ ] Contracting [ ] Ecology [x] Botany [x] Archaeology
[ ] Fisheries [ ] Research [ ] Landscape Arch [x] GIS

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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 Treatments:
Site stablization of cultural resource:
Situation: The perimeter of the structure should be treated to prevent degradation caused by rock fall and erosional sheet wash from upslope as a result of loss of stabilizing vegetation. Loss of vegetation along the creek bank also increases the likelihood of a major storm event leading to bank overflow on the east side of the structure undermining the structure and accelerating deterioration and collapse.
Recommendation: Stablize the structure with sand bags and straw wattles to protect it from erosion.

Seeding and Mulching
Situation: Soil quality will be impacted in the burned area due to the spread of noxious weeds and invasive plant species from nearby existing populations, and possibly the introduction of undesirable vegetation species as a result of fire suppression efforts. Soil productivity is also at moderate to high risk from loss of topsoil. Accelerated erosion caused by loss of the native plant community has put the area at risk from wind and overland flow erosion. Field reviews by the Forest Service BAER team identified a risk for expansion of existing medusahead, leafy spurge, and Russian knapweed populations. There is potential for noxious weed spread from known populations adjacent to fire via access routes and seeds brought into the area by uncleaned fire suppression equipment and suppression activities. Cheatgrass (*Bromus tectorum*) is a non-native (European) invasive annual species that can obtain a competitive advantage over native species after fire. This competitive advantage is created by loss of shade and litter cover on the soil surface and loss of water retention and infiltration with burned soils. One occurrence of a fire engine driving through a weed population was observed during the fire.

The burn area has a scattered population of cheatgrass with a few larger infestations. Since cheatgrass expands so quickly after a fire, much of this area is susceptible to cheatgrass conversion. Cheatgrass conversion could limit the watershed function to the top few inches of soil, increase the future fire frequency, create a pocket population that could invade adjacent areas and limit the site capability of the area to produce

forage and shelter for wildlife. Allotments that will be rested will be specified in annual operating plans for each allotment. If monitoring indicates that invasive plants, lack of recovery, or unauthorized livestock use are concerns, the timeline to reintroduce livestock grazing may be extended.
Soil quality can also be impacted in moderate to high fire intensity areas where the fire consumed the overstory vegetation canopy and the majority of the effective ground cover that dissipates rainfall and regulates overland flow. The shallow soil cover layer and surface soils host the microorganisms that process organic materials making nutrients available for plant uptake. Even with average precipitation, accelerated erosion rates combined with higher surface runoff efficiencies may move the exposed soil and the thin veneer of nutrient-rich ash off-site, thereby decreasing soil quality over the long term.

Recommendation:

Approximately 272 acres of moderate to high severity burn areas are recommended for mulching with agricultural straw. The mulch is to be placed above highly susceptible areas where erosion and unacceptable soil loss is expected to occur. The mulch is to provide ground cover and energy dissipation on slopes above the highly erodible areas. The mulch will be applied aerially with coverage rates of 50-60%. The mulch will be certified weed free and will be tested to ensure cheat grass is not present in the mulch.

We propose to use a mixed native seed and short-lived non-native seed mix to achieve both rapid short-term growth and long-term survival. The seed mixture has short-lived forbs because forbs are usually the first plants to come back on a site. Use of these early colonizers and are expected to outcompete the medusahead and cheatgrass in addition there are invasive forbs, ver buttercup, and hoary alyssum on the site and to protect soil quality and to keep the system as natural as possible these native-forbs are being used to outcompete the invasive forbs. In this area a fast growing ground cover is a top priority to provide protection for the soil surface until the slower growing, but deeper rooted species can establish thereby reducing the potential for expansion of known noxious weed infestations into susceptible burn areas and prevent increased weed densities. Using non BAER funds we plan to aggressively treat any noxious weed infestations found as a result of the fire using appropriate application techniques and herbicides.

Seed and mulch are going to be applied aerialy. Seeding will be done in 150 foot strips along the road ways where cheatgrass exist as a small percentage of the understory within the native plant community and where isolated weed patches occur adajacent to the fire area. This area is approximately 500 acres. Mulching and seeding will occur on 272 acres of the most intensly burned watershed. The proposed seed mix is the same. The mulch is expected to reduce erosion, provide ground cover and create a better mico-climate for the seeds. As per Forest Service protocol, livestock will not be permitted to graze on the seeded area for at least two years following treatment.

Recommendation:

Table 7. Proposed Seed Mix

Common Name	Scientific Name	seeds/lb	pls/acre	seed/ft2	$/pls	$/amount	% of lbs	% by #
Squirreltail	*Elymus elymoides ToeJam*	192,000	1.5	6.6		20	11%	8%
Quickguard	*Triticum aestivum x Secale cereale***	130,000	4	11.9		0.85	28%	15%
Sandberg's bluegrass	*Poa secunda*	926,000	2	42.5		6.5	14%	54%
Indian ricegrass	*Achnatherum hymenoides**	141,000	1.5	4.9		6.5	11%	6%
Needle and tread	*Hesterostipa comata ssp. comata*	115,000	2	5.3		36	14%	7%
Bluebunch wheatgrass	*Pseudoroegneria spicata**	140,000	2	6.4		8.5	14%	8%
Rocky Mountain beeplant	*Cleome serrulata*	64,000	0.25	0.4		19.5	2%	0%
Lewis flax	*Linum lewisii*	18,300	1	0.4		12.75	7%	1%
	TOTAL FOR UPLAND SEED MIX		14.25	78.4	0	$110.60		
				Total Acres		772		
				Total Cost		$85,383.20		

The following monitoring results are provided to support our seeding recommendation:

The Sherwood and Adaven Fires in the Grant Quinn Range in 2007 were located on juniper encroached black sagebrush sites with arid, rocky, shallow soils. These sites were seeded with mixtures that contained Indian ricegrass (*Achnatherum hymenoides),* squirreltail *(Elymus elymoides), and* blue flax (*Linum lewisii).* The year 2007 and the years 2008 and 2009 were drought years. By the first year, all three of these species had

germinated and were growing in the monitoring plots. Monitoring completed in the third year following the seeding showed that these species had increased density and cover and there was a reduction in introduced annuals. The invasive annuals at these sites were primarily forbs, halogeton (*Halogeton glomerata*) and Russian thistle (*Salsola tragus*). The seeded forb, blue flax, had a higher cover rate than the seeded grasses.
The South Sage Fire on the Schell Range of the Ely Ranger District was located on mountain mahogany, white fir, aspen and meadow habitats with shallow to moderately deep, rocky soils. The mahogany and a portion of the fir slopes were seeded with a seed mix of Indian ricegrass (*Achnatherum hymenoides),* bluebunch wheatgrass (*Psuedoroegneria spicata*), and slender ryegrass (*Elymus trachycaulus*). All three of these grasses had germinated and were growing good the first year. During the second year these grasses dominated the cover in the mahogany and fir sites, and by the third year the returning native vegetation had started to catch up with the seeded plants. The bluebunch wheatgrass did not do as well in the fir site at the other two seeded grasses, likely due to the colder soil temperatures on these north facing slopes.
The East Side Rock Ridge (ESSR) Fire occurred in 2008 in mountain big sagebrush, Wyoming big sagebrush, low sagebrush, snowbrush, aspen and subalpine fir. (I wasn't responsible for the BAER seeding, but used the same mix to hand seed dozer lines for the fire rehabilitation). The species used in the seed mix for hand seeding the dozer lines contained Indian ricegrass (*Achnatherum hymenoides),* bluebunch wheatgrass (*Psuedoroegneria spicata*), Sandberg's bluegrass (*Poa secunda*), slender ryegrass (*Elymus trachycaulus*), Idaho fescue (*Festuca idahoensis*), and yarrow (*Achillea millefolium*). I've gone by a couple of the lower elevation dozer lines while monitoring existing plots on the ESSR burn, and have stopped to look. Bluebunch wheatgrass, Sandberg's bluegrass, slender ryegrass, and yarrow are present and have helped to make the dozer lines stable and they have not become OHV roads.
The Elkhorn Wildfire of 2008 in the Tonopah District burned pinyon-juniper encroached black sagebrush, pinyon-juniper and re-burned a spring riparian system. The soils on the lower slopes were shallow, high in sand and highly vulnerable to erosion. BAER funded seeding and chaining of 800 acres of these lower slopes. The species used included Indian ricegrass (*Achnatherum hymenoides),* Sandberg's bluegrass (*Poa secunda*), needle and thread grass (*Hesperostipa comata*), blue grama (Bouteloua gracilis), blue flax (*Linum lewisii),* firecracker penstemon (*Penstemon eatonii*) and other desert forbs. The first year there were good results with Indian ricegrass, Sandberg's bluegrass, needle and thread grass, blue grama, blue flax and firecracker penstemon. The seeded cover was much higher in the chained area than in the unchained area of the burn. Due to unusual heavy rain storms in 2008/2009, erosion was a problem, especially on the unseeded and/or unchained portions of the burn. The burned and unseeded plot on the fire had a frequency of 66 in 2010 compared to a frequency of 167 and 286 for the seeded and, seeded and chained plots.

Channel Treatments:

Sediment Detention Structures

Situation: Above Buttermilk Creek there are large source areas of slopes 9 to 60 percent, where the fire burned at moderate to high fire intensity and there was total canopy consumption and 80 to 100 percent mortality of the pre-fire bitterbrush and sagebrush stands. On these slopes there is very little roughness to slow runoff and capture sediment and the time frame for desired vegetation communities to effectively restore the soil-hydrologic functions may exceed 5 years. During this time it is expected erosion rates will be 5,600 cubic yards per square mile for the first year after the fire and 3,200 cubic yards per square mile the second year. Buttermilk Creek is a Gully with width of 15 to 40 feet and depth from 15 to greater than 50 feet depth that stretches for approximately 1½ miles. There is a good opportunity to capture the erosion in the gully by placing strategically placed rock structures within the gully. If not managed the eroding sediment will cause more accelerated erosion and land loss within the gully. There is one private residence at the base of the Creek.
Recommendation: Construct 3, 20' to 40' X 10' rock structures with 25' to 50' aprons on the downslop side and 3 to 1 aprons on the upslope side, using 4' minus material.

Roads and Trail Treatments:

Reconstruct Road Drainage to Accommodate Expected Runoff Flows

Situation: The roads within the burned area were found to have issues with their drainage system and are now at risk for mud/debris flows, rock falls, and loss of water control. Low water crossings are located at the bottom of the drainages that are burnt and may be filled with debris material as water comes off the hillsides. Areas of roadways lack proper drainage structures, which channel water along roadway surface.
Recommendation: Install rolling dips/water bars, improve low water crossings, and remove the berms on the outside of the roadway where they will be most efficient and necessary. These rolling dips will assist to remove

water from the roadway that has become trapped on the road surface causing erosion and travel hazards. Low water crossings can also be used when large drainages cross the road and no culverts are in place. See Burned Area Emergency Response Treatments Catalog Chapter 4, Rolling Dips pages 109-112, Low-Water Stream Crossings pages 121-126 for more information.

Storm Inspection and Response

Situation: The roads in the Tom Basin Fire are located around the bottom of mountain, going up the mountain to a pass, and around the top of mountain. The roads around the bottom of the mountain cross multiple drainages with low water crossings at each of the drainages. The road going up the mountain, Buttermilk Road has four water crossing in the lower section before it heads up the mountain and ends around the top of mountain. The roads at the top of the mountain don't have the issues of large watersheds collecting a large amount of water however the elevation increase from the bottom will have a larger snow pack and increased chance of runoff issues.

There is an immediate and future threat to travelers along the roads within the burned area due to the increased potential for rolling and falling rock from burned slopes above the roadways and increased potential for flooding and mudflows in the low water crossings. With the loss of vegetation normal storm frequencies and magnitudes can more easily initiate erosion on the hillslopes. It is likely that this change/increase in runoff may cover the roads or cause washouts at the stream crossings. These events make for hazardous access to forest roads and put the safety of users at risk.

Recommendation: Monitor the low water crossings after significant storm events to ensure the crossing is still passable by vehicles and that the crossings are not plugged and causing water to flow down the road instead of in the floodplain. Maintain and/or repair any damage to road surfaces. See Burned Area Emergency Response Treatments Catalog Chapter 4, Storm Inspection, and Response pages 149 -152 for more information.

Protection/Safety Treatments:

Install Warning Signs

Situation: The severity of burn in some watersheds, combined with road location, high possibility of flooding, mud/debris flow, and falling rocks has increased the risk to road users.

Recommendation: Replace warning signs damaged by the fire. Install "Entering Burn Area Warning" signs and "Road Closed" signs where necessary to properly alert the travelers of the dangers ahead. "Road Closed" signs should also be used in conjunction with gated closures. See Burned Area Emergency Response Treatments Catalog Chapter 5, Warning Signs pages 179-182 for more information.

Gated Closures

Situation: The severity of burn in some watersheds, combined with road location and the high likeliness of flooding the low water crossings, mud/debris flow and falling rocks has increased the potential for life threatening situations. Slopes have also been made unstable due to severity of burn and loss of vegetation. Increased flows in drainage channels will likely cause flooding of roads especially at the low water crossings.

Recommendation: Install gated closures on all roads where travel has been determined to be unsafe during the winter and spring and during any major storm event. Gated closures should also be installed in areas where burn has exposed sites sensitive to rock-fall and/or vehicle or recreational use. Roads identified in *Table-1 List of roads with Post Fire issues identified during field investigations* are planned for a seasonal/storm event closure. The closure is to protect users of the road system. Closures are to remain in place until chance of wetting storms and spring breakup has passed, and the district is comfortable with allowing user traffic. Continuous reevaluation should take place to determine effectiveness of treatment. The district should work to keep the public and forest users informed of forest situations and flooding risk, even from minimal rain fall. Locations for the gates should be placed to keep the road users off of the main Buttermilk Road, 50471. Four gate installations are proposed, the first being slightly above the helicopter site and before the first crossing. The second gate should be on the 50471A road, to allow traffic to use the lower country but not get up to the Buttermilk Road and drive to the summit. The third gate would be at the top of the summit, still allowing access to the area above the summit just not from the bottom of Dry Creek. The fourth gate should on the Spring City side at the first Forest Boundary which would allow access to the private lands outside the forest boundary while still keeping users off of the Buttermilk Road. Timing of the gate closures will be crucial to

the success of the installation, before first major storm event and opening after the road has a chance to dry out from spring breakup. See Burned Area Emergency Response Treatments Catalog Chapter 5, Protective Fences, and Barriers pages 173-178 for more information.

Adits and Mining Shafts

Situation: Five abandoned mine features located in the west half of the west half of section 22, T43N R40E, MDM that warrant mitigation due to the public safety hazards they present, see figure 1. These features are accessed by a jeep trail depicted on the 7.5 minute Spring City Quad map and now clearly visible from the main access roads (FS 471 and 472 roads) due to the Tom Basin Fire. The waste rock dumps outside these features, previously obscured by vegetation, are now completely obvious as a direct result from the fire. These dumps (attractive nuisances) alert visitors to the three adits, one shaft, and one decline present in this drainage.

Recommendation: Close the features to prevent accidental injury or death, Closures can be built over a two day period. Helicopter support is needed to mobilize equipment and supplies from suitable location identified in the middle of section 21. Bat compatible closures will be built where warranted, exclusions performed to prevent entrapment of wildlife where foam closures are warranted.

Table 4. Mine Feature Presenting Public Safety Hazard

TB-2 partially caved adit, dimensions: 10' wide x 6' high x 125' long - foam closure, helicopter (heli) support
TB-4 partially caved adit, dimensions: 4' wide x 5' high x 250' total workings (with decline and stopes); connects w/ TB-5; foam closure w/ 6" diam - 10' PVC vent pipe; ATV access
TB-5 adit, dimensions: 4.5' wide x 6' high x 250' workings; bat compatible gate; heli support
TB-6 shaft, dimensions 8' x 10' x 150' deep; collar sloughed to 12' x 18'; water-filled; grate; helicopter support
TB-7 decline, dimensions 4.5' wide x 4' high x 15' long (water-filled); foam plug; heli support

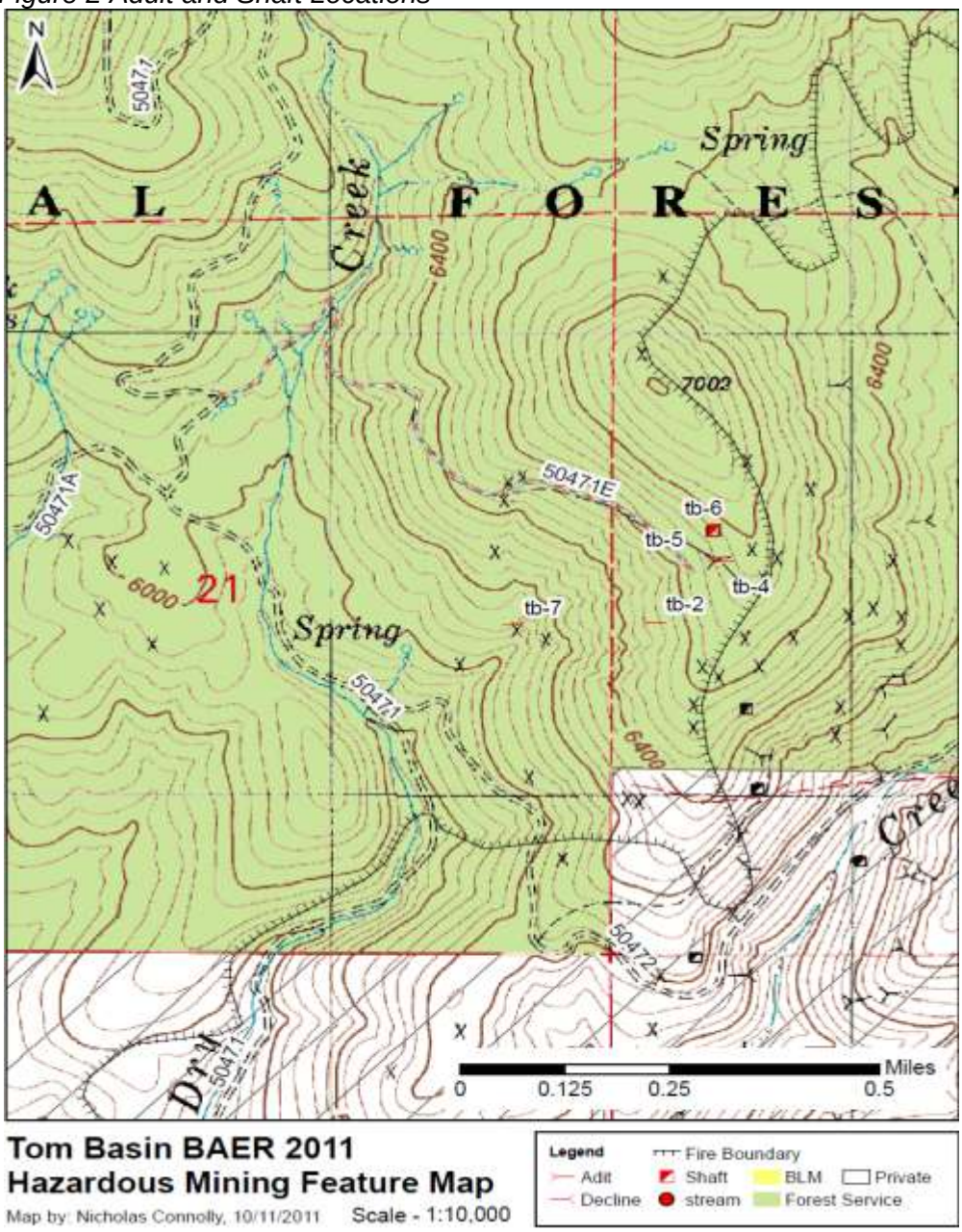
AML Alternative 1

To mitigate the public safety hazard 100 percent full closure is being requested the cost of that treatment is 31,747. See table below

Table 5. Alternative 1 costs (full closeure)

Item	Units	Cost per Unit	Cost Total
Personnel Time	3		9057
Helicopter time	10	1,300	13,000
Over time	1	2,600	2,600
Polyurethane foam	21 cases	240	5,040
Steel	1	2,700	2,700
Misc Supplies: steel remesh, pipe, plastic, gloves, fuel, wire	1	150	150
Travel and Per diem	1	2,200	2,200
Total Cost			**31.747**

Figure 2 Aduit and Shaft Locations



BAER requires us to consider the Minimum Alternative. In this alternative the treatment will consist of fencing the audits and shaft, installing warning signs and ripping 50' of the road entrance and placing boulder so the public will not be able to drive to the mining features. The cost for this Alternative is displayed in table 6. This alternative does not mitigate the hazard because the public will still be able access via OHV or walking. The adits and shafts will still be accessible for exploring and spelunking. The fences will likely draw attention to the mine openings from those driving on the Forest road below.

Table 6. AML Minimum Alternative

Item	Description	Cost
Fencing contract	5, ½ acres fences @ 10,000 per mi and COR	4,189
Sign installation	5 signs installed	2640
Road closure	Rock and rip first 50' of access route	3,940
Total cost		**10,769**

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.)

Monitoring for Weed and Invasives

The burned area will be monitored for the presence of noxious and invasive weeds by a district weed treatment crew. New weed locations will be documented with GPS positions and photographs. Noxious weed monitoring will occur at least once in early summer and once in fall to detect weeds before they mature. Weeds will be treated with herbicide when they are encountered. Monitoring levels may be increased if weeds are detected in the area. A monitoring report following the first year monitoring results will be submitted along with the interim report.

Monitoring for invasive weeds will be conducted in the spring of 2012 to assess the success of the seeding. If monitoring indicates a need for re-treatment, the Forest will request additional funds at that time. Monitoring to evaluate treatment effectiveness, survey for new weed populations and expansion of existing populations, 2 employees for 35 days each = 70 days.

Effectiveness Monitoring

Road Treatment Effectiveness: Monitor the effectiveness of the road stabilization treatments at diverting water off the roads. This will be most important during, or after, storm events. This monitoring can be done by district personnel, 5 days.

Cultural Site Stablization Effectiveness: Visit the site after first desgin storm event to make sure sand bags are providing the predicted protection district acheologist 1 day.

Channel Treatment Effectiveness – District and/or Forest hydrologist to visit treatment site and monitor effectiveness of sediment detention structures after first several storms. They will check on capacity and rateof fill 4 days.

Land Treatment Effectivness: Seeding and Mulching – Cheatgrass, medusahead, leafy spurge, and Russian knapweed populations - Monitor three (3) point intercept cover studies, each with three transects belts strategically placed within the burn perimeter. These transects will measure effectiveness of seeding, weed treatments and soil stability. Local or forest staff will conduct the monitoring. Each transect will be read every other year for up to three years beginning in 2012, 10 days. Recovery will be determined by vegetation and litter reaching 80% of potential natural condition. Potential for the proposed seeding is 80% cover of desirable vegetation and litter, thus recovery would occur at a 64% cover of desired vegetation and litter.

Monitoring by District Range Personnel will occur to ensure the required rest of allotments occur as per the Forest Plan.

			NFS Lands				Other Lands				All
		Unit	# of		Other		# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$		units	$	Units	$	$
A. Land Treatments											
Arial Mulch											
Aerial Contract (end product)	acre	550	272	$149,600							$81,600
Mulch testing	each	300	2	$600							$600
Mulch	ton	60	550	$33,000							$16,320
Seeding											
Seed	acre	111	772	$85,692							$85,383
Aerial Contract (end product)	acre	140	500	$70,000							$55,000
COR and inspector for contract	day	310	10	$3,100							$3,100
Safety officer	day	380	14	$5,320							$5,320
Arch site stabilization material								$0		$0	
Sand bags/sand 56/6	total	93	1	$93	$0			$0		$0	$93
Straw wattles & stakes 4/50	total	89	1	$89	$0			$0		$0	$89
Arch site stabilization personnel	hr	21	6	$126	$0						$126
Insert new items above this line!								$0		$0	
Subtotal Land Treatments				$347,620	$0			$0		$0	
B. Channel Treatments											
Sediment traps	structu	3	1690	$5,070	$0						5070
Insert new items above this line!								$0		$0	
Subtotal Channel Treat.				$5,070	$0			$0		$0	
C. Road and Trails											
Rolling dips	each	600	30	$18,000	$0			$0		$0	$18,000
Berm removal	mi	1,000	8	$8,000	$0			$0		$0	$8,000
Low water crossing	each	500	11	$5,500	$0			$0		$0	$5,500
Contract Admin/COR cost				$0	$0						$0
Civil Engineer, COR GS-9	hr	24	220	$5,280	$0						$5,280
Fisheries Biologist, GS-11	hr	21	40	$840	$0						$840
Cultural Resource Specialist, GS-11	hr	21	20	$420	$0						$420
Rip rap rock placement	cy	40	50	$2,000	$0						$2,000
Travel cost	total	1	4500	$4,500	$0						$4,500
Insert new items above this line!											
Subtotal Road & Trails				$44,540	$0			$0		$0	
D. Protection/Safety											
Roads											
Gates (installed)	each	4300	4	$17,200	$0			$0		$0	$17,200
Signs & posts installed	each	200	8	$1,600	$0			$0		$0	$1,600
Route markers furnished & installed	each	75	10	$0	$0			$0		$0	
AML closures											
Materials											
Fence contract	each	2700	1	$4,189	$0						$4,189
Signs & posts installed	each	2640	1	$2,640	$0						$2,640
Rock and Rip road	each	3940	1	$3,940	$0						$3,940
Insert new items above this line!											
Subtotal protection/safety				$29,569	$0			$0		$0	
E. BAER Evaluation											
Implementation team leader	days	360	25	$9,000				$0		$0	$9,000
Team leader assistant/Logisticts	days	365	10	$3,650							
Initial Evaluation				$29,000						$0	$29,000
Insert new items above this line!				---				$0		$0	
Subtotal Evaluation				---	$0			$0		$0	
F. Monitoring											
Weeds,	days	135	70	$9,450	$0			$0		$0	$9,450
Effectivness	days	364	20	$7,280							$7,280
Insert new items above this line!											
Subtotal Monitoring				$16,730	$0			$0		$0	
G. Totals				**$456,179.0**	$0			**$0**		**$0**	
Previously approved				$356,190							
Total for this request				**$99,989.0**							$381,540

Part VI – Emergency Stabilization Treatments and Source of Funds Initial

PART VII - APPROVALS

1. __

_/S/JEANNE M. HIGGINS
JEANNE M HIGGINS_____ November 22, 2011
Forest Supervisor (signature) Date

2.

/S/ERIN O'CONNOR (for)
HARV FORSGREN_____ November 23, 2011
Regional Forester (signature) Date