

Edited J.Bruggink 10/04/2007

Date of Report: October 3, 2007

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 rehabilitation measures)
- ☒ 2. Interim Report
 - ☒ Updating the initial funding request based on more accurate site data or design analysis
 - ☐ Status of accomplishments to date
- ☐ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: **Murphy Fire Complex: Wildhorse Zone**

B. Fire Number: **ID-TFD-002030 DR62**

C. State: **NV**

D. County: **Elko**

E. Region: **4**

F. Forest: **Humboldt-Toiyabe**

G. District: **Mountain City**

H. Fire Incident Job Code: **DR62**

I. Date Fire Started: **7/16/07 @ 1912 hrs.**

J. Date Fire Contained: **8/02/07 @ 1800 hrs.**

K. Suppression Cost: **@ 7/31/07 \$7,526,238**

L. Fire Suppression Damages Repaired with Suppression Funds:

1. Within the Murphy Complex: **Wildhorse Zone**, there are **30.6 miles of dozerline on the following:**

- BLM **0**
- Private **0.5**
- State **0**
- FS **30.1**

2. Fireline seeded (miles): None to date.

3. Other (identify): None to date.

M. Watershed Number: Watersheds within the Burned area include 1705010201, 1705010202, 1705010203

N. Total Acres Burned: FS Acres **[91,124]** BLM **[245]** State **[2,137]** Private **[1,657]**

O. Vegetation Types:

Mountain Big Sagebrush – Antelope Bitterbrush Plant Community - This plant community is primarily located in the lower foothills and alluvial fans. The dominant vegetation is antelope bitterbrush (*Purshia tridentata*) and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Other common species include yellow rabbitbrush (*Chrysothamnus viscidiflorus*), serviceberry (*Amelanchier alnifolia*), basin wildrye (*Leymus cinereus*), Indian ricegrass (*Achnatherum hymenoides*), slender wheatgrass (*Elymus trachycaulis trachycaulis*) and bluebunch wheatgrass (*Pseudoroegneria spicata*).

Aspen Woodland - Aspen woodlands are found in riparian drainages and on hill slopes from about 6000 to 9000 feet elevation. Stands average in size from about five acres to several hundred acres and are comprised of one to several clones. These woodlands are multi-layered, consisting of a tree layer, shrub layer and herbaceous layer. Vegetative cover usually exceeds 150%.

The tree layer consists primarily of aspen (*Populus tremuloides*), sometimes with conifers such as subalpine fir (*Abies lasiocarpa*), limber pine (*Pinus flexilis*) or Rocky Mountain juniper (*Juniperus scopulorum*). The shrub layer consists of snowberry (*Symphoricarpos oreophilus*), serviceberry (*Amelanchier alnifolia*), currant or gooseberry (*Ribes* spp.), chokecherry (*Prunus virginiana*), grey alder (*Alnus incana*) and Oregon grape (*Mahonia repens*).

The understory herbaceous layer is primarily shade tolerant, tall forbs and grasses. The most common herbaceous species are sweet anise (*Osmorhiza occidentalis*), meadowrue (*Thalictrum fendleri*), columbine (*Aquilegia formosa*), monkshood (*Aconitum columbianum*), False Solomon's seal (*Maianthemum stellatum*), mountain bluebells (*Mertensia oblongifolia*), showy stickseed (*Hackelia floribunda*), wild geranium (*Geranium viscosissimum*), nettleleaf horsemint (*Agastache urticifolia*), larkspur (*Delphinium nuttallianum*), checker mallow (*Sidalcea oregana*), mountain brome (*Bromus marginatus*), Columbia needlegrass (*Achnatherum nelsonii*) and slender wheatgrass (*Elymus trachycaulis*).

Riparian Woodlands and Meadows - The riparian areas are mostly found in narrow canyons next to streams or adjacent to springs on side or perched drainages. Sites with high rock content and rapid flowing water tend to be dominated by wooded species and areas with low water flow gradients tend to be herbaceous dominated. Vegetative cover typically exceeds 150%.

Common wooded species include Pacific willow (*Salix lasiandra*), Booth's willow (*Salix boothii*), yellow willow (*Salix lutea*), grey alder (*Alnus incana*), dogwood (*Cornus sericea*), thimbleberry (*Rubus parviflora*), wax currant (*Ribes cereum*), golden currant (*Ribes aureum*) and prickly current (*Ribes lacustre*).

Common herbaceous species include Nebraska sedge (*Carex nebrascensis*), small-wing sedge (*Carex microptera*), field sedge (*Carex praegracilis*), slender beaked sedge (*Carex athrostachya*), Baltic rush (*Juncus balticus*), sword-leaf rush (*Juncus ensifolius*), tufted hairgrass (*Deschampsia caespitosa*), mannagrass (*Glyceria striata*) and Nevada bluegrass (*Poa secunda* ssp. *juncifolia*).

Coniferous Forest - Coniferous forest community types are most common on north facing hill slopes above 7500 feet. These areas are commonly snow covered into late spring or early summer. While overstory cover is typically great than 60%, the understory cover tends to be below 30%.

Throughout much of the burn area, the dominant tree is subalpine fir (*Abies lasiocarpa*) with some limber pine (*Pinus flexilis*) and aspen (*Populus tremuloides*). Understory species include snow currant (*Ribes niveum*), whitestem gooseberry (*Ribes inerme*), snowberry (*Symphoricarpos oreophilus*), Ross' sedge (*Carex rossii*), Sandberg's bluegrass (*Poa secunda*), Idaho fescue (*Festuca idahoensis*), Chamisso arnica (*Arnica chamissonis*) and subalpine daisy (*Erigeron peregrinus*).

Mixed Montane - Deciduous Shrubland - These plant communities generally have colder, deeper soils and slightly more moisture availability than the adjacent big sagebrush shrublands, and tend to occur

between big sagebrush and aspen plant communities. Vegetative cover tends to be slightly more than 100%.

The dominant shrub species are chokecherry (*Prunus virginiana*), serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos oreophilus*), wax currant (*Ribes cereum*), gooseberry currant (*Ribes montigenum*) and elderberry (*Sambucus nigra*).

Understory species include Great Basin wildrye (*Leymus cinereus*), Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), slender wheatgrass (*Elymus trachycaulus*), Letterman's needlegrass (*Achnatherum lettermanii*), Poa secunda (Sandberg's bluegrass), Bromus marginatus (mountain brome), nettleleaf horsemint (*Agastache urticifolia*), wild geranium (*Geranium viscosissimum*), sweet anise (*Osmorhiza berteroi*), arrowleaf balsamroot (*Balsamorhiza sagittata*), dwarf waterleaf (*Hydrophyllum capitatum*), wild forget-me-not (*Hackelia floribunda*), Indian paintbrush (*Castilleja angustifolia*), bluebells (*Mertensia ciliata*), Rydberg's penstemon (*Penstemon rydbergii*), one-flowered sunflower (*Helianthella uniflora*) and hawksbeard (*Crepis acuminata*).

Agricultural Pastureland - These areas are primarily Nevada State lands that were purchased about 20 years ago for wildlife habitat enhancement. At the time of purchase, the pastures were irrigated native and seeded hay meadows, but are currently converting back to more natural functioning systems. Vegetative cover generally exceeds 100%, most of which are graminoids.

Common species are meadow barley (*Hordeum brachyantherum*), Nevada bluegrass (*Poa secunda* ssp. *juncifolia*), slender beaked sedge (*Carex athrostachya*), field sedge (*Carex praegracilis*), smallwing sedge (*Carex microptera*), Nebraska sedge (*Carex nebrascensis*), timothy (*Phleum pratense*), meadow foxtail (*Alopecurus pratensis*), Kentucky bluegrass (*Poa pratensis*), bulrush (*Scirpus microcarpus*), Baltic rush (*Juncus balticus*), water ragwort (*Senecio hydrophilus*), yellow pea (*Thermopsis rhombifolia*), Western aster (*Symphyotrichum spathulatum*) and rosy pussytoes (*Antennaria microphylla*).

Juniper Woodlands - The juniper woodlands are situated on dry, rocky slopes and ridges scattered within the burned area. The species is Utah juniper (*Juniperus osteosperma*) possibly with some Western juniper (*Juniperus occidentalis*) hybridization. Vegetative cover is typically less than 75%. Surface pavement and rock is common.

Common understory species include early sagebrush (*Artemisia arbuscula* ssp. *longiloba*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), bitterbrush (*Purshia tridentata*), serviceberry (*Amelanchier alnifolia*), Sandberg's bluegrass (*Poa secunda*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), Letterman's needlegrass (*Achnatherum lettermanii*), lava aster (*Ionactis alpina*), dusty maiden (*Chaenactis douglasii*) and threadleaf fleabane (*Erigeron filiformis*).

Big Sagebrush Shrubland - The big sagebrush cover type is located on hill slopes throughout the burned area. It is generally found on fairly deep, well-drained soils. The dominant species of big sagebrush is mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Vegetative cover is generally less than 90%.

Associated shrub species include bitterbrush (*Purshia tridentata*), serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos oreophilus*), snowbrush (*Ceanothus velutinus*), low sagebrush (*Artemisia arbuscula*), whorled buckwheat (*Eriogonum heracleoides*), sulfur buckwheat (*Eriogonum umbellatum*) and, wax current (*Ribes cereum*).

Herbaceous species include Sandberg's bluegrass (*Poa secunda*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), Letterman's needlegrass (*Achnatherum lettermanii*), arrowleaf balsamroot (*Balsamorhiza sagittata*), spotted stickseed (*Hackelia patens*), longleaf phlox (*Phlox longifolia*), stoneseed (*Lithospermum ruderale*), cinquefoil (*Potentilla gracilis*), yarrow (*Achillea millefolium*), silver lupine (*Lupinus argenteus*), milkvetch or locoweed (*Astragalus* spp.), biscuitroot (*Lomatium* spp.), sego lily (*Calochortus nuttallii*), Indian paintbrush (*Castilleja angustifolia*), ,

Rydberg's penstemon (*Penstemon rydbergii*), hawksbeard (*Crepis acuminata*), Columbia ragwort (*Senecio integerrimus*), Geyer's onion (*Allium geyeri*), and threadleaf fleabane (*Erigeron filiformis*).

Low Sagebrush Steppe - The low sagebrush steppe occurs on ridgelines and hill slopes in the burned area. These sites tend to have shallow soils and a significant amount of surface rock and pavement. The dominant species of sagebrush is early sagebrush (*Artemisia arbuscula* ssp. *longiloba*). Vegetative cover is typically less than 70%.

Common understory species include Sandberg's bluegrass (*Poa secunda*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), Letterman's needlegrass (*Achnatherum lettermanii*), squirreltail (*Elymus elymoides*), silver lupine (*Lupinus argenteus*) slender buckwheat (*Eriogonum microthecum*), sulfur buckwheat (*Eriogonum umbellatum*), matted buckwheat (*Eriogonum caespitosum*), dwarf paintbrush (*Castilleja nana*), woolly sunflower (*Eriophyllum lanatum*), dusty maiden (*Chaenactis douglasii*) and threadleaf fleabane (*Erigeron filiformis*).

Curleaf Mountain Mahogany Woodland - The Curleaf Mountain Mahogany cover type occupies rocky ridges and moderate hill slopes in areas with shallow soils and exposed, fractured bedrock. The dominant cover species is mountain mahogany (*Cercocarpus ledifolius*). Total plant cover is usually less than 70%.

Common associated species include mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), low sagebrush (*Artemisia arbuscula*), bitterbrush (*Purshia tridentata*), *Amelanchier alnifolia* (serviceberry) and *Symphoricarpos oreophilus* (snowberry), Utah juniper (*Juniperus osteosperma*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*) Columbia needlegrass (*Achnatherum nelsonii*), milkvetch or locoweed (*Astragalus* spp.), rockcress (*Boechera* spp.), rock spirea (*Petrophyton caespitosum*), jewelflower (*Streptanthus cordatus*), Oregon grape (*Mahonia repens*), matted buckwheat (*Eriogonum caespitosum*), Rydberg's penstemon (*Penstemon rydbergii*), toadflax (*Comandra umbellata*), scarlet gilia (*Ipomopsis aggregata*), prickly sandwort (*Arenaria aculeata*) and western aster (*Symphyotrichum spathulatum*).

Perennial Forb – Sparsely Vegetated - This vegetative cover type is dominated by low growing shrubs and forbs and is often found at high elevations on rocky ridges and areas with poor soil development. Vegetative cover is often less than 50%. Due to sparse plant life, these areas usually burn very lightly, if at all.

Dominant species include low sagebrush (*Artemisia arbuscula* ssp. *longiloba*), matted buckwheat (*Eriogonum caespitosum*), Lewis buckwheat (*Eriogonum lewisii*), bitterroot (*Lewisia rediviva*), pygmy bitterroot (*Lewisia pygmaea*), ballhead gilia (*Ipomopsis congesta*), woolly sunflower (*Eriophyllum lanatum*), stemless mock goldenweed (*Stenotus acaulis*), narrowleaf mock goldenweed (*Stenotus stenophyllus*), woolly groundsel (*Packera cana*), scorpion milkvetch (*Astragalus lentiginosus* ssp. *scorpionis*), egg milkvetch is *Astragalus oophorus*, rock spirea (*Petrophyton caespitosum*) and Chambers' twinpod (*Physaria chambersii*).

Introduced Annuals - This disturbance induced plant community has been altered to an extent that it is functioning outside of its natural parameters. Soil types and slopes are variable, but the soil surface is often depleted of organic matter and moisture holding capacity. Vegetative cover is typically less than 60%.

Common species associated with this cover type are cheatgrass (*Bromus tectorum*), tumbled mustard (*Sisymbrium altissimum*), pale alyssum (*Alyssum alyssoides*), false flax (*Camelina microcarpa*), Basin blue eyes (*Nemophila brevifolia*), and white-stem blazing star (*Menzelia albicaulis*).

Aquatic / Woody Riparian Plant Community – Riverine plant communities occurs extensively throughout the drainages of the burned area, are diverse and provide important habitat for biodiversity as they function as migration corridors for many species. Habitats include areas with perennial water and vegetation indicative of riparian areas. The soils in these drainages tend to be very rocky and the slopes

steep. In the Bruneau River Canyon, there are sandy loam soils on stream banks. Heavy spring run-off events combined with steep, rocky slopes prevent deposition of sediments to the extent needed for meadow development and keep the erosion potential high. Dominant species include Pacific willow (*Salix lucida* ssp. *lasianдра*), thinleaf alder (*Alnus incana* ssp. *tenuifolia*), Aspen (*Populus tremuloides*), Rocky mountain juniper (*Juniperus scopulorum*) and to a lesser extent at lower elevations, black cottonwood (*Populus balsamifera trichocarpa*). Other species found in unburned areas adjacent to the fire or within the burn snowberry (*Symphoricarpos oreophilus*), currant black and red, (*Ribes* spp.), chokecherry (*Prunus virginia*), Oregon grape (*Mahonia repens*), wild rose (*Rosa woodsii*), Nelson's needlegrass (*Achnatherum nelsonii*), mountain brome (*Bromus carinatus*), slender wheatgrass (*Elymus trachycaulis trachycaulis*) and blue wildrye (*Elymus glaucus*).

The woody species that inhabit these plant communities all readily respond after disturbances such as fire and flooding. In many instances, fire stimulates the regrowth of these plants. By next spring, many of the shrubs and trees will be resprouting and adequate water will facilitate their growth throughout the summer. In two to five years, these sites will be mostly recovered.

Rare Plants Listed as Forest Service (FS) Sensitive Plants - Species that may occur within the Wildhorse Zone are described as follows:

- Meadow pussytoes (*Antennaria arcuata*) [FS sensitive] – A rare species found at the edge of wild hay meadows.
- Upswept moonwort (*Botrychium ascendens*) [FS sensitive] – Primarily in open habitats such as alpine meadows, avalanche meadows, and grassy roadsides in springs and seeps. Probably has some affinity for limestone or other calcareous substrates. Known locations from SMNRA. Potential in Bridgeport, Carson, Austin/Tonopah.
- Dainty moonwort (*Botrychium crenulatum*) [FS sensitive] – A rare species that occurs in moist or wet meadows at high elevations (8700 to 11150 ft.). Several locations are known above 8,000 ft near the fire area.
- Sunflower Flat buckwheat (*Eriogonum douglasii* var. *elkoense*) – Newly described from Sunflower Flat, on gentle slopes with rocky clay soils. Usually in patches of less dense vegetation. Known locations on Mountain city RD.
- Lewis' Buckwheat (*Eriogonum lewisii*) [FS sensitive] – A rare small perennial plant found on exposed, rocky ridges at high elevations. It is known to be found on sedimentary geology.
- Grime's Vetchling (*Lathyrus grimesii*) [FS sensitive] – This plant occupies dry, open, shallow, silty clay soils of the Schoonover Formation. This plant grows in relatively barren patches on mostly steep slopes. Associated vegetation is sparse to moderately dense usually dominated by Leiberg's clover in association with bitterbrush (*Purshia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), mountain sagebrush (*Artemisia tridentata vaseyana*) and bluebunch wheatgrass (*Pseudoroegneria spicata*). Cheatgrass (*Bromus tectorum*) and occasionally spurge (*Euphorbia esula*) may be invasive on these sites.
- Least Phacelia (*Phacelia minutissima*) [FS sensitive]: This plant is found on seasonally saturated, sparsely vegetated, partially shaded to fully exposed areas of bare soil and mud banks in meadows, at perimeters of corn lily (*Veratrum californicum*), *Wyethia amplexicaulis*, and/or aspen (*Populus tremuloides*) stands, in sagebrush swales, along creek bed high-water lines, or around springs, in flat to gently sloping areas. It is a wetland-dependent species.
- Leiberg's Clover (*Trifolium leibergii*) [FS sensitive]: This plant is found on dry, shallow, relatively barren gravel soils, mostly on ridge tops and upper slopes. It is often found in association with low sagebrush (*Artemisia arbuscula*) and other associated species.

P. Dominant Soils:

The soils vary greatly across the high plains and mountainous landscapes in the Murphy Fire Complex Area. The primary soil differences are associated with changes in geologic parent materials and the depth to bedrock. The vast majority of the soils have organic enriched surface layers and are classified as mollisols.

The valley bottoms soils associated with riparian vegetation on stream terraces and floodplains tend to be deep, well drained; and are coarse-loamy, skeletal soils in the areas of granitic parent materials. In the areas of volcanic tuff parent materials the soils tend to have higher silt and clay content that tend to be classified as either fine-loamy or fine textural groups with moderate amounts of gravels and stones.

The rolling foothills, hillslopes, and alluvial fans tend to be moderately sloping 15 to 35% slopes again most of the soils being deep well-drained or moderately well-drained, skeletal mollisolls. The finer textures are associated with the volcanic parent materials, and the coarser textures with the granitic parent materials. There are some areas of loamy textured soils that occur on these landforms, which are derived from the meta-sedimentry and sedimentary parent material.

The steeper 35 to 65% mountain slopes tend to have a major component of shallow to bedrock soils, and rock-outcrops associated with these landforms. The percentage of shallower soils is greatest on the meta-sedimentary and granitic parent materials; and less dominant on the volcanic parent materials areas. Again most of these soils tend to be mollisols with the relationship of the soil texture being linked to the parent materials as described earlier.

There are a small percentage of the landforms that are structural breaklands with very steep 50 to 75%+ slopes that are dominantly rock-land and rubble-land with a minor percentage of weakly developed skeletal soils that are classified as inceptisols or entisols.

Q. Geologic Types:

North part of the burned area: The higher slopes east of the Bruneau River are underlain with granite (along road #751). The geology north of the granite and mid-to-high slopes west of the Bruneau River is mostly ignimbrite and welded tuff with small areas of sedimentary rocks (shale, limestone and conglomerate). Lower slopes along the Bruneau River are sedimentary.

Central part of the burned area is cored by granite that extends east and west from the Bruneau River up to the ridgelines. Small areas of tuff, ignimbrite and rhyolite occur on lower slopes. All of Rattlesnake Canyon just to the north is composed of limestone. The Meadow Creek watershed to the west side is established mostly in rhyolite with granite on the higher east slopes and tuff in the valley bottom near its confluence with the Bruneau River. Tuff, sandstone, conglomerate and quartzite occur in the southwest corner of the burned area.

South part of the burned area: Pine and Rosebud mountains are predominately quartzite with schist, limestone, shale and rhyolite on the lower west slopes above the Bruneau River. Tuff, sandstone, conglomerate and small areas of rhyolite make up the lower slopes of Copper Mountain (quartzite) east of the Bruneau River.

The rhyolitic areas have the most dense drainage network – primarily dendritic to subparallel. The granitic areas contain a lot of disintegrating granite in place (grus) with tors (“stonehenges”) along ridgelines. The granite, tuff and limestone support an intermediary dense drainage network – dendritic to subparallel. The quartzite and clastic sedimentary rocks have the least dense drainage network – also dendritic to subparallel.

A few landslides, colluvial aprons and longitudinal talus/scree slopes exist within the burned area, mostly in the south part where there are large exposures of quartzite and sedimentary rocks.

R. Miles of Stream Channels by Order or Class:

Intermittent or Emphemeral :	1,048 miles
Perennial:	267 miles
Seasonal Ditch	15 miles

S. Transportation System: Roads: Improved Dirt **26** miles, Unimproved **99** miles, Unimproved 4WD **75** miles. Other **18** miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 19,294 (unburned/very low), **67,088** (low), **8,741** (moderate), **41** (high)

The burn severity acreages were calculated from a Burned Area Reflectance Classification Map (BARC) provided by the U.S. Forest Service's (FS) remote Sensing Application Center (RSAC). The map was verified during the field assessment and adjusted as necessary.

B. Water-Repellent Soil (acres): 3,115 (2% of low + 20% of moderate + 60% of high)

C. Soil Erosion Hazard Rating (acres): 9,320 (low 0-5.0 t/a), **65,116** (moderate 5.1-7.0 t/a) **20,700** (high >7.0 t/a)

D. Erosion Potential: tons/acre

Disturbed WEPP is a web-based application that uses the Water Erosion Prediction Project (WEPP) technology to estimate soil erosion and potential runoff on burned and non-burned forest and rangelands. The web address is <http://forest.moscowsl.wsu.edu/fswepp/> for all the documentation for the model. The Humboldt-Toiyabe NF Land type Association Map were used as the map units to compare the differences in post-fire soil erosion and the probability of post-fire runoff. Each Land type Association map unit in the fire area was rated as high, moderate or low, for erosion and runoff potential. Pre-burn grassland and shrubland cover types were both used. Post burn the low severity fire disturbance was used, and one year after the burn (one growing season) grassland was used as the cover type. Input into the model included length of slope, gradient of slope, percent rock cover, percent vegetative cover and surface soil texture. Typical slope lengths and gradient and surface soil textures were based on U.S.G.S. maps, soil survey data, and field observations. There was a significant decrease in post fire soil erosion as vegetation cover increased the first and second growing seasons.

Erosion Potential (tons/acre)

Land type Association	Percent of Fire Area	Pre-fire Grassland Soil Erosion (tons/acre)	Probability of Pre-fire Runoff from Grassland (%)	Pre-fire Shrubland Soil Erosion (ton/acre)	Probability of Pre-fire Runoff from Shrubland (%)	Potential Post-fire Soil Erosion tons/acre	Probability of Post-fire Runoff (%)	Potential Soil Erosion One Year Following Fire (tons/acre)
33	21.9	.4	23	0	0	7.2	80	3.8
34	8.7	.5	33	0	0	6.9	80	3.9
37	9.6	.6	33	0	0	5.8	80	3.5
38	1.7	.6	33	0	0	5.3	80	2.7
39	24.8	.6	33	0	0	6.7	80	4.4
46	15.7	.3	23	0	0	6.1	77	3.0
47	1.6	.6	33	0	0	5.6	80	3.3
68	2.0	.5	33	0	0	5.0	80	3.3
77	2.8	.2	30	0	0	4.8	93	3.5
86	5.6	2.7	30	0	0	6.9	93	4.1
98	4.5	2.9	43	0	0	4.8	50	3.4

Note – Land type Association Map units occupying less than 1% of fire area were not modeled.

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 1-3

B. Design Chance of Success, (percent): 73%

NOTE: This is the probability that the 10 year storm will not occur in the next 3 years. There is a 27% chance that the 10 year storm will occur in that 3 year period. The assumption is that treatments will be successful for storms less than the 10 year storm magnitude (ie. 2 year, 5 year, etc).

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

D. Design Storm Duration, (hours): 0.5 to 1

E. Design Storm Magnitude, (inches): 1

F. Design Flow, (cubic feet / second/ square mile): 6-9

G. Estimated Reduction in Infiltration, (percent): <10%

NOTE: although the burned area exhibited very little reduction in infiltration (ie. Water repellency), compared with unburned conditions, the consumption of both the shrub canopy and duff layers has removed interception and storage components, thus increasing both the chance of runoff as well as the frequency and amount.

H. Adjusted Design Flow, (cfs per square mile): N/A

PART V - SUMMARY OF ANALYSIS

Following is a description of Critical Values/Resources and Threats (For further information see the Murphy Complex: Wildhorse Zone Burn Area Emergency Stabilization Plan created by the National Interagency BAER Team):

A. Describe Critical Values/Resources Threats

Values at Risk

Due to burned vegetation and exposed soil on steep mountain slopes, there is a significant potential for increased runoff and soil erosion/sedimentation, which results in six main values at risk.

Life and Property: There are numerous locations in the fire area that are at increased risk for potential flash floods, rock-fall and debris flows soil/erosion sedimentation due to steep slopes, geologic materials, and additional post-fire runoff. Field reviews within and downstream of the burn confirmed that there are no situations where farmlands or irrigation systems in flood prone areas are at risk. Numerous locations in the fire area are an immediate and future threat to travelers along roads due to the increased potential for rolling and falling rock from burned slopes and the increased potential for flash floods and mudflows. The Bruneau Canyon Road serves as one of the primary access routes to maintain the power line that serves the communities of Murphy Hot Springs, Jarbidge, Mountain City and Duck valley. The Trail Gulch Road is used extensively for access into and out of Jarbidge in spring and fall when the Bear Creek Summit Road is closed due to snow and/or the lower Jarbidge Road is at risk of flooding.

Cultural Resources: Results from record searches at the Humboldt-Toiyabe National Forest's Mountain City Ranger District and the BLM's Elko Field Office revealed that known site density is relatively low within the fire boundary. However, it should be cautioned that much of the area has

not been inventoried for cultural resources. Of the currently known/documented sites, ranching and mining comprise the majority of site types. Of interest, over half of the sites are prehistoric or ethnographic. The Duck Valley Shoshone-Paiute Tribes identified areas of high sensitivity/ cultural concern within the burn. It was observed that two tribal graves within the fire were burned over and sustained minimal damage through vegetation removal and heat spalling of rock. Many sites are located along drainage bottoms and slopes and evidence of soil movement and wind erosion were observed in these areas. Cultural resources in such locations may be susceptible to both erosional and depositional processes.

Specific values at risk include: 1) Of the 35 FS sites within the fire boundary, at least eight known cabins and a number of outbuildings were burned down during the fire. Other prehistoric and ethnographic sites were also burned over. 2) Illegal surface collection and digging are known in the general area but, up to now, only specific high value sites have been targeted. Low artifact yield and disbursed nature of the prehistoric, ethnographic and historic ranching/mining sites, coupled with minimal evidence of looting/vandalism in the fire area does not support additional law enforcement patrols at this time. 3) Both ends of the trestle flume across Bruneau River burned and collapsed. This has destabilized the remaining portion over the river. It is on Nevada Department of Wildlife lands. This and other non-specification observations and findings will be passed on through management recommendations to the appropriate agencies.

Road Systems: Several road segments were identified to have potential post-fire road surface drainage problems and/or under-sized culverts, which will be unable to handle post-fire stream flows because of the anticipated, increased runoff. Some roads were also damaged because of suppression actions; and storm damage and rock fall pose a risk to public safety on roadways. During the fire, an engineer inspected the Hicks Summit Bridge on FS Road 745 and determined that it had been significantly damaged (M. Balen, personnel communication). For safety, it was recommended that the bridge be closed to public access until it could be replaced or repaired. The bridge was removed and a temporary low water crossing on FS land was constructed to facilitate suppression activities. The crossing needs further work to remove debris in the river to protect downstream redband trout and bull trout.

Storm damage to FS Bruneau River Road (067) created a threat to human life due to few to no turnarounds and gullies that are camouflaged, especially during night. Signs were placed on the north and south end of the canyon warning about the road being impassable ahead. Vehicle traffic presently cannot cross where damage occurred. The road is impassable until it can be repaired and be able to withstand storm events. This road primarily serves as a powerline maintenance road. The powerline serves the communities of Jarbidge, Murphy Hot Springs, Duck Valley, and Mountain City. It also provides access to ranching operations for the Prunty Ranch. Further damage may degrade water quality and threaten downstream redband trout and bull trout.

Drainages: The majority of the burned area did not have detrimentally affected vegetation or soils. There was only 1.2% of the burned area classified as having high vegetation mortality, and less than .1% of the fire area was determined to have a *high soil burn severity*. Where soils with *high soil burn severity* occurred, they were not associated with critical values at risk. The majority of the fire (70.5%) was determined to have burned with a *low soil burn severity*. Of area burned in the fire, approximately 3.3 percent of those sites were hydrophobic. The sites where hydrophobic conditions were observed were well distributed across the fire area.

The fact that the fire burned with a low severity in most areas does not mean there were not fire effects. Greater potential for soil erosion exists in areas with steeper slopes (>40%), which a high percentage of the fire area is. Because of the steep slopes and moderate permeability rates associated with the majority of the soils in the fire area, the removal of the vegetation and surface organic layer has increased the runoff potential from these sites significantly. The Disturbed WEPP modeling results showed a 47 to 63% increase in probability runoff from the vast majority of the burned lands in the fire area.

Road damage threatens water quality in the Bruneau and Jarbidge Rivers, and some of its tributaries that contain roads. A few hundred yards of ephemeral drainage channels of the Jarbidge River is listed as a 303d Impaired Water (Nevada 2005). Temperature is an issue of concern due to burned riparian vegetation. There will be increased sediment yield and associated nutrient yield from the runoff waters of the burned watersheds. The sediment increases may directly affect some fish habitat within the burn, but the effects to downstream water quality are expected to be minor.

Wildlife: The Jarbidge River Distinct Population Segment (DPS) of bull trout (*Salvelinus confluentus*) is a federally listed threatened species with occupied habitat on the Humboldt-Toiyabe National Forest adjacent to the burned area. The Murphy Complex: Wildhorse Zone Fire and associated suppression actions were determined to have “no effect” to bull trout, given there was no spatial overlap between the disturbance mechanisms and the local population watersheds identified in the draft bull trout recovery plan. However, there are no physical barriers preventing fish movement between the Jarbidge and Bruneau Rivers. Information in the Draft Bull Trout Recovery Plan (FWS 2004) suggests a strong probability that sections of the Bruneau River provide over-wintering habitat for fluvial (migratory) bull trout.

Occupied habitat for the Columbia spotted frog (*Rana luteiventris*), occurs in beaver complexes, springs, and ponds scattered throughout the burned area. The Columbia spotted frog is also on the Region 4 Sensitive Species List (2003) and would be detrimentally affected by increased post-fire sedimentation. Columbia spotted frog habitat has undergone broad-scale changes throughout its range. Southern isolated populations in the Great Basin are declining and face major threats, including habitat loss/degradation. Riparian and wetland habitat conditions have generally declined across the Interior Colombia Basin (Wisdom et al. 2000). Human-related factors affecting these resources include livestock grazing, timber harvest, fire suppression, irrigation, hydroelectric-power, mining, flood control projects, introduction of exotic plants and others. Decreasing amounts of large woody debris, increased vulnerability to stand-replacing fire, departures in vegetation structure and compositions that increase potential for soil erosion, source habitat declines, increases in abundance and distribution of exotic plants, and high levels of disturbed soil: each of these attributes could adversely affect water quality and other aspects of Columbia spotted frog source habitat and ultimately reduce the quality and quantity of source habitat for this species.

Greater sage grouse (*Centrocercus urophasianus*), a Region 4 Sensitive Species, occupy habitat throughout the burned area. All types of sage grouse habitat were extensively burned within the Murphy Complex: Wildhorse Zone fire perimeter, including approximately 4,620 acres of sage grouse nesting/early brood rearing habitat, 77,446 acres of winter habitat and 95,163 acres of summer/late brood rearing habitat. The area within the fire perimeter included approximately 66,000 acres (4%) of the North Fork Sage Grouse Population Management Unit (PMU) and 29,000 acres (11%) of the Islands Sage Grouse PMU. Sage grouse population estimates in the Draft Northeast Nevada Sagebrush Ecosystem Management Plan range from 1,094 to 1,313 for the Islands PMU and 10,046 to 12,055 for the North Fork PMU. Trend estimates are static with a long-term downward trend for both PMUs.

Pygmy rabbit (*Brachylagus idahoensis*) has been documented in numerous sites throughout the burned area. The Regional Forester's list (2003) designated pygmy rabbit as a sensitive species in Forest Service-Region 4. Pygmy rabbits are typically found in areas of tall, dense sagebrush (*Artemisia* spp.) cover, and are highly dependent on sagebrush to provide both food and shelter throughout the year. Their diet in the winter consists of up to 99 percent sagebrush. According to the listing, petition and literature cited in 70 FR 29259, fire effects to pygmy rabbits may include mortality, increased predation, or home range abandonment. Post-fire loss of big sagebrush habitat within this large burned area will contribute to a cumulative effect of habitat loss for pygmy rabbits across their range. Remaining forage for pygmy rabbits within the fire perimeter appears to be limited to unburned islands and what remains of riparian vegetation. This loss of suitable habitat and forage abundance is likely to result in displacement, reproductive failure, and/or mortality of individual pygmy rabbits in big sagebrush habitat that burned at moderate to high intensity.

Other special emphasis species within the burned area include redband trout (*Oncorhynchus mykiss gairdneri*). There are approximately 70.0 miles of fish bearing (redband trout) streams within the Murphy Complex: Wildhorse Zone. The redband trout is designated as a Nevada State sensitive (S2) species (<http://heritage.nv.gov/lists/fishes.html>). Logging, mining, agriculture, grazing, dams, over harvest and hybridization and competition with other trout contributed to the decline of redband trout abundance, distribution and genetic diversity in the Columbia River Basin (Williams et al. 1989; Behnke 1992). Consequently, many populations are restricted to isolated headwater streams that may serve as refugia until effective conservation and rehabilitation strategies are implemented. Long-term persistence of these populations is threatened by loss of migratory life history forms and connectivity with other populations, which is critical to maintaining genetic diversity and dispersal among populations (Rieman and McIntyre 1995). Despite their broad distribution, few strong populations exist. Known or predicted secure populations inhabit 17 percent of the historic range and 24 percent of the present range (Lee et al. 1997). Furthermore, Lee et al. (1997) reported that only 30 percent of the watersheds supporting spawning and rearing populations were classified as strong populations.

Post-fire erosion and sediment delivery are expected to result in increased sediment storage in beaver complexes and depositional stream reaches within and immediately downstream from the Murphy Complex: Wildhorse Zone burned area. The resulting sediment deposition is likely to render a portion of the occupied redband trout habitat unsuitably shallow and decrease the macroinvertebrate production of the affected surface waters. This loss of suitable habitat and prey abundance is likely to result in displacement, reproductive failure, and/or mortality of redband trout in affected sites within the Murphy Complex: Wildhorse Zone. There is also a potential for channel reorganizing events to be triggered by moderate to high-intensity rainfall in extensively burned drainages. Where they affect occupied stream reaches, post-fire channel reorganizing events are likely to extirpate local populations of trout and render the affected habitat unsuitable for several years.

Approximately 34,203 acres of critical winter range for mule deer were affected within the burned area. Short-term loss of forage species will cause the deer to focus on to unburned areas within the fire and to shift to areas outside the fire perimeter. Inter and intra-species competition for available forage may increase until shrubs, forbs and grasses grow. Most of the shrubs within the fire area were killed by the fire. The majority of the grass species will resprout as soon as climatic conditions allow. The loss of productivity of critical winter range for mule deer is the top priority issue identified by NDOW for the Murphy Complex: Wildhorse Zone burned area. Particular concern was expressed regarding high vegetation mortality of key shrub species (mountain big sage and basin big sage) on lower-elevation slopes and valley bottoms along the Bruneau River and Meadow Creek.

Vegetation, Long-term Soil Productivity and Ecosystem Integrity: Several areas have a high potential for post-fire soil erosion if a high intensity rainstorm were to occur during the first two years following the fire. The loss of a major portion of the topsoil would reduce the soil productivity of these sites. Vegetation mortality was determined to be 1% high, 24% moderate, 55% low and 20% low to unburned on lands within the Wildhorse Zone. There were approximately 46 vegetation types classified within the fire area by LANDFIRE that were grouped into a final 11 groups. Predominant among these groups are the big sagebrush shrubland and low sagebrush steppe. Primary forest cover types within the burn are aspen stands, with mixed conifers in the higher elevations. Seven Forest Sensitive species and one Forest Watch species are known to occur within and adjacent to the fire area and one may have been impacted by a dozer line during suppression activities. A suppression impact to a FS R4 sensitive plant species (Lewis' buckwheat (*Eriogonum lewisii*) may have occurred in Sections 32, 33, 34 and 35, T47N, R8E, and MDM. The dozer line impacts are approximately two ½ miles in length. Monitoring will determine if there are any impacts.

Aerial reconnaissance and field observations within the fire perimeter revealed that most burned area soils fell into a low soil burn severity classification. Viable shrub root crowns and grass roots should allow for natural revegetation of these sites but with somewhat reduced post-fire foliage coverage than pre-fire. Soils with a moderate or high burn severity classification were limited to several relatively small areas and have significantly less viable shrub root crowns. The natural

revegetation on these sites is likely slower and will have less foliage cover than the moderate burn severity sites.

Noxious and invasive non-native plant species are present within the fire area that poses a significant threat to native plant recovery. Additional populations were mapped as part of the vegetation field assessment. Canada thistle is already sprouting in burned riparian areas. These species will be expected to expand their range unless detection and control treatments are proposed. Early detection (monitoring) and control treatments are proposed to mitigate this. The major strategy of the vegetation treatments is to allow the native grasses to recover to a point where they will out compete invasive species such as cheatgrass and other noxious weeds.

The combination of livestock grazing and expected soil loss due to runoff threatens the natural recovery of critical natural resources and sensitive wildlife species. Without temporary fencing, the grazing permittees will lose usage of substantial portions of their grazing allotments, which were unburned. There is a real threat to the establishment and spread of noxious and invasive species, within the burned area, and protect recovering vegetation resources from further damage by grazing livestock. Habitat that is critical to the R4 sensitive wildlife species (see above description of sensitive wildlife) makes vegetation recovery a significant issue.

The following invasive noxious weed species have been identified as a threat, and are on Federal and Western States noxious weed lists within the Wildhorse Zone: Canada thistle (*Cirsium arvense*), Wild licorice (*Glycyrrhiza lepidota*), Bull thistle (*Cirsium vulgare*), Scotch cotton thistle (*Onopordum acanthium*), Perennial pepperweed (*Lepidium latidolium*), Hoary cress (*Cardaria draba*), Yellowspine thistle (*Cirsium ochrocentrum*), Black Henbane (*Hyoscyamus niger*), and cheatgrass (*Bromus tectorum*).

On August 21, 2007, Cheri Howell (Humboldt-Toiyabe Ecologist) assessed the burned area for cheatgrass invasion potential. She determined that there is a serious and significant threat to long-term soil productivity and ecosystem integrity due to an expected expansion of cheatgrass in the burned area. Several locations within the burned area have previously burned within the last 10 years, putting these sites outside of the expected natural burn frequency of 25 to 70 years. These past fires, excessive grazing, and drought have resulted in an increase in cheatgrass in dryer areas scattered throughout the northern end of the fire perimeter. These areas include 274 acres near the confluence of Meadow and Coffeepot Creeks, 289 acres in Rattlesnake Canyon, 351 acres along the Bruneau River, and 1,677 acres near the Mink Ranch. Unburned cheatgrass as well as cheatgrass seed were observed in these areas. A recommendation was made to treat 150 acres of the most concentrated patches of cheatgrass with an herbicide. The areas treated with herbicide would then be seeded with a native seed mix to diminish reestablishment of cheatgrass. The area surrounding the herbicide treatments would also be seeded with a native seed mix to increase the diversity. A more detailed description of the proposed treatment is contained in the treatment narrative section below. (See proposed cheatgrass treatment pg. 24)

B. Emergency Treatment Objectives:

The primary objectives of the Murphy Fire Complex: Wildhorse Zone Burned Area Emergency Response Plan is:

1. Protect human life and Safety:
 - To prescribe post-fire mitigation measures necessary to protect human life and property along the road system.
 - To protect human life and property where the fire damaged bridge at Hicks Summit was removed and a low water crossing constructed.
 - Install warning signs on applicable roads about the hazards ahead.
 - Storm proof road crossing at streams, stabilize and prevent loss of road prism, and improve or replace undersized or damaged culverts.
2. Stabilize Threaten & Endangered and State Sensitive Species Habitat

- To prevent permanent impairment of T& E and state sensitive species habitat.
 - Rest areas of the burn from grazing within the guidelines provided by the Forest Plan and repair fencing for active adjacent allotments.
3. Provide for the natural recovery of native plant communities in a timely fashion in order to reduce or eliminate a threat to long-term soil productivity and protect the ecological integrity of the ecosystem.
 4. Control Invasive Plants
 - Control expected invasion by Canada thistle (*Cirsium arvense*), Wild licorice (*Glycyrrhiza lepidota*), Bull thistle (*Cirsium vulgare*), Scotch cotton thistle (*Onopordum acanthium*), Perennial pepperweed (*Lepidium latidolium*), Hoary cress (*Cardaria draba*), Yellowspine thistle (*Cirsium ochrocentrum*), and Black Henbane (*Hyoscyamus niger*). Some limited control of cheatgrass (*Bromus tectorum*) in small patches within native plants, where deemed feasible.
 - Monitor for new invasive species, new infestations of known noxious weeds, and native vegetation recovery that can compete with noxious weeds.
 5. Stabilize or mitigate soil loss, increased runoff, and sediment delivery to streams within the watershed
 - To promptly stabilize and prevent further degradation to affected watersheds and soils
 - Monitor vegetation recovery, and treatment effectiveness to determine if additional or amended treatments are required.

C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:

Land 90 % Channel N/A % Roads 75 %

D. Probability of Treatment Success

Treatment	Years after Treatment		
	1	3	5
Land (specs 8,11)	75	80	90
Channel (no treatment)	---	---	---
Roads (specs 2,3,4,5,6)	75	---	70
Monitoring (specs 7,9,10*)	90	90	90
Protection/Safety (specs 12)	100	90	85

*Natural regrowth of vegetaton with rest from grazing.

E. Cost of No-Action (Including Loss): \$18,000,000

F. Cost of Selected Alternative (Including Loss): \$5,000,000

The cost of the selected alternative was calculated using the BAER cost/risk analysis worksheet (BAER Emergency Stabilization Plan, 2007). Direct costs associated with weed monitoring and storm proofing stream crossings costs were evaluated as well as the cost associated with the risk of failure in the first year following treatment.

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

Team Leader: Erv Gasser
 Email: erv_gasser@nps.gov

Phone: 206-220-4263

FAX: 206-220-4160

H.Treatment Narrative:

The following treatments have been proposed by the National Interagency BAER Team. For more details, see the specification sheets in the Murphy Fire Complex: Wildhorse Zone Burned Area Emergency Stabilization Plan. The specification number in the the Emergency Stabilization Plan are used here to maintain consistency between reports. These treatments are only for the Wildhorse Zone on the Humboldt-Toiyable National Forest. Treatments for the Castleford Zone is being completed separately by the Jarbidge Field Office, BLM.

Lands Treatment: Specifications 8,11

Specification #8 Treat Noxious Weeds

8A. General Description: Control the spread of known non-native weed infestations within the Murphy Fire Complex: Wildhorse Zone perimeter, prior to seed-set and maturation. Treatment of these Nevada Listed noxious weeds is proposed since the likelihood of their movement into non-infested areas of the burn has been aggravated by the fire. Utilize integrated pest management techniques (chemical, biological, mechanical and cultural control methods) as appropriate to prevent the spread and establishment of noxious weeds within the fire area. No cost was developed for possible hand grubbing of weeds since so few weeds will be treated in this manner, and grubbing will occur in association with spraying.

8B. Location/ (Suitable) Sites: Control the spread of all known exotic weed populations along road systems, riparian areas, and suppression related sites within the fire area. Based on the point and polygonal locations of known infestations, the acreage of noxious weeds is estimated at 704 acres. All known and mapped locations of weeds are on the Mountain City Ranger District. Many of the locations are plotted as point source data. For ease of computing treatment costs, each point was rounded to one acre in size. Known noxious weeds that occur within the Murphy Fire Complex: Wildhorse Zone are Canada thistle (*Cirsium arvense*), Wild licorice (*Glycyrrhiza lepidota*), Bull thistle (*Cirsium vulgare*), Scotch cotton thistle (*Onopordum acanthium*), Perennial pepperweed (*Lepidium latidolium*), Hoary cress (*Cardaria draba*), Yellowspine thistle (*Cirsium ochrocentrum*) and Black Henbane (*Hyoscyamus niger*). Refer to the FS Geographic Information System database for approximate locations of noxious weeds. Control sites identified include but are not limited to areas along FS Roads 745 (Meadow Creek), 751 (Trail Gulch), 067 (Bruneau Canyon), 997 (Rattlesnake Canyon), 061 (Wickiup Creek, and 750. Other sites occur in Martin Creek, Hicks Summit and above Robinson Canyon. USFS control efforts should be conducted along all major road systems but in accordance with area closures and safety guidelines. Estimated acres for control by species are as follows: Canada thistle, 548 acres; Bull thistle, 107 acres; Scotch cotton thistle, 44 acres; Perennial pepperweed, 1 acre; Hoary cress, 1 acre; Black Henbane, 1 acre; Yellowspine thistle, 1 acre; and Wild licorice, 1 acre.

8C. Design/Construction Specifications:

1. Control the spread of noxious/non-native weeds identified during FS monitoring surveys prior to seed set. Use truck-mounted sprayers, ATV-mounted sprayers, or backpack sprayers (depending on access and ability for spray personnel to reach infestations), to apply herbicides to selected noxious weed populations. All spraying will be in accordance with guidelines contained within FS management plans and approved Environmental documents using FS approved herbicides, such as 2,4-D amine®, metsulfuron methyl (Escort®), glyphosate (Roundup®) and picloram (Tordon®), and clopyralid (Transline®).
2. Hand grub noxious weeds located at springs and along perennial creeks. Grubbing will be by FS crews or technicians.
3. Follow-up control in subsequent years on all new infestation sites, as identified through noxious weed detection monitoring surveys, will be through rehabilitation or other funding requests.
4. Biological agents will be used in conjunction with hand grubbing in sensitive riparian areas where herbicidal control is not feasible. Some of the biological agents approved for use in the Noxious Weed Control Program Environmental Assessment are several Thistle Weevils, a Tephritid Fly, Aphthona beetles, moths, mites and midges. A complete listing is contained

in the aforementioned Environmental Assessment. The biological agents will be used primarily on Canada thistle.

8D. Purpose of Treatment Specifications (relate to damage/change caused by fire):

Stabilization funds can be used to control non-native invasive plants within burned areas when it can be documented that those plants may quickly invade or hamper re-establishment of native vegetation. Using IPM techniques to minimize the establishment of non-native invasive species within the burned area.

8E. Treatment consistent with Agency Land Management Plan (identify which plan):

Humboldt-Toiyabe National Forest Land and Resource Management Plan and FEIS, Noxious Weed Control Environmental Assessment

8F. Treatment Effectiveness Monitoring Proposed: A separate specification for detection of noxious weeds/non-native invasive plant species and control effectiveness has been prepared. Control of noxious weeds in both burned and unburned areas will be monitored according to the strategy outlined. Control will be considered successful upon determination that all noxious weeds have been controlled or populations maintained at their pre-fire distribution.

Specification #11 Protective Fencing

11A. General Description: Construct new temporary fences to protect recovery and keep domestic livestock out of burned grazing units within grazing allotments within the perimeter of the Murphy Fire Complex: Wildhorse Zone. The proposed fencing will minimize or avoid livestock grazing impacts to riparian areas along fish-bearing streams, protect critical riparian habitat for the Columbia spotted frog, and sagebrush and pygmy rabbit habitat for at least two years to allow for natural vegetation recovery. The 13 miles of fence are necessary to prevent grazing by livestock on burned areas needing grazing rest or to protect habitat critical to R4 sensitive species in critical habitats. All temporary protective fences will tie into existing unburned fences or natural barriers. Fences will be primarily built along the fire perimeter, between the burned and unburned portions of the grazing allotment units. When recovery parameters are met, the fences will be removed.

11B. Location/ (Suitable) Sites: Fences will be constructed along the fire perimeter where no previous fence existed, or where an enclosure is needed to protect recovering sites. Miles of fence to be constructed are approximate and located on or within the following grazing allotments: Bruneau Summer C&H*, 3 miles. This fencing is proposed to protect critical or significant natural resources such as critical habitat for R4 sensitive wildlife species such as the sage grouse, pygmy rabbit, goshawk, Columbia spotted frog, and probable Bull trout over-wintering habitat, along with protecting recovering areas from uses that could cause erosion or interfere with recovery. This allotment lies above the Bruneau River, probable Bull trout over-wintering habitat, Telephone C&H, 3 miles. This fence is located between burned and unburned portions of the allotment and will protect recovering areas that are critical habitat for the pygmy rabbit and critical wintering habitat for the sage grouse. The fence will also protect recovering burned area from uses that could cause erosion or interfere with recovery, McDonald Creek C&H, 1 mile. This fence is also located between burned and unburned portions of the allotment and will protect recovering areas that are critical habitat for the pygmy rabbit, a sensitive R4 wildlife species, and protect critical wintering habitat for the sage grouse. The fence will also protect recovering areas from uses that could cause erosion or interfere with recovery, and 6 miles of fencing between the burned Wickiup S&G* and the unburned Buck Creek C&H*. The Wickiup allotment is critical habitat for R4 sensitive species sage grouse, pygmy rabbit, and the Columbia spotted frog. This allotment is also within the watershed above the Bruneau River, probable Bull trout over-wintering habitat. The fence, which separates the Mountain City Ranger District from the Jarbidge Ranger District, will allow grazing to continue outside the perimeter of the fire, stabilize critical or significant natural resources, and protect recovering areas from uses that could cause erosion or interfere with recovery. See the Vegetation Treatment Map in Appendix IV for actual fence location.

11C. Design/Construction Specifications: Fence construction shall be in accordance with standard FS design specifications. Due to the nature of the fence needed, which is to keep livestock out of recovering burned vegetation, and to protect recovery of critical habitat for R4 sensitive wildlife species, the minimum fence specification needed to meet objectives in this area is a 4-strand barbed wire fence. An electric fence was considered but rejected due to several reasons that follow. The areas where these fences are located are rough country, approximately 3-4 hours away from the

agency by 4-wheel drive vehicle. The 4 portions of fence are far apart, which would allow inspection of only one or two portions per day. Electric fence requires considerable maintenance, much more than a 4-strand wire fence. Wild ungulates, such as elk and deer, do not recognize electric fencing for the purpose intended. When an elk hits an electric fence, it keeps on going. To maintain the electric fence would require reconstructing the electric fence on a constant basis. The maintenance cost would far outweigh any savings realized by constructing the electric fence. A 3-strand barbed wire fence also was not considered, as re-growth in the burned protected recovery areas will be an irresistible attraction to domestic livestock. Cattle will try, in any way possible, to access the new green re-growth. In discussions with Range Specialists, a 3-strand wire fence will not keep the livestock out. Therefore, recovery to critical habitat for the R4 sensitive species will not occur. A 4-strand barbed wire fence is justifiable based on the critical habitat recovery requirements in the critical habitats.

1. New fence materials shall be utilized.
2. Construct 4-wire fence consisting of 3 strands of 12 ½ gauge twisted barbed wire and a bottom strand of 12 ½ gauge twisted smooth wire unless high stock pressure necessitates barbed wire throughout. Steel 6 foot T-posts shall be driven 1 ½ feet in the ground and spaced at 16 ½ feet apart.
3. Steel posts (stress panels) as recommended by the Forest shall be placed at all corners or at a maximum of ¼ mile spacing or as necessary to compensate for topographical undulations. Posts are to be secured using 12 ½ gauge smooth twisted steel wire with a minimum breaking strength of 950 pounds of force.
4. Additional specifications regarding fence replacement will be provided at time of reconstruction initiation.
5. Remove all burned fence materials that interfere with installation of temporary fence.

11D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Installing protective fences or barriers to protect recovering areas that are habitat critical to support R4 sensitive wildlife species (sage grouse, pygmy, Columbia spotted frog) and the Bull trout, a T&E species, which probably over-winters in the Bruneau River, down slope from the proposed fencing areas. Fences will protect habitat and resources for recovery and will keep domestic livestock out of the recovering critical natural vegetation (FSM 2523.2 #2).

11E. Treatment consistent with Agency Land Management Plan (identify which plan):

Humboldt-Toiyabe National Forest Land and Resource Management Plan and FEIS.

11F. Treatment Effectiveness Monitoring Proposed: The treatment will be considered successful if domestic livestock are excluded from the burned area during the prescribed recovery period, and habitat for sensitive wildlife species is allowed to recover without erosion or interference. (See Vegetation Resources Assessment for details)

Channel: No Treatment Planned

Road Treatments: Specifications 2,3,4,5,6

Specification #2 Hicks Ford Improvement

2A. General Description: the Bridge at Hicks crossing on Road #745 in Meadow Creek Canyon was severely damaged during the fire and had to be removed for safety purposes. An emergency ford was quickly installed to keep the road in service during suppression operations, but the riprap used to armor the ford was not properly set in the streambed for long-term service. The riprap was placed on top of the channel bottom, essentially filling in the channel, such that the ford now functions like a French drain and creates a backwater pool on the upstream side of the ford. This backwater situation has the potential to divert storm runoff out of the channel and on to the road, thus increasing the risk for further damage to the road. The riprap needs to be embedded lower into the bed of the channel so that it functions as the channel bottom rather than filling the conveyance area of the channel and diminishing the channel's capacity to pass flow at the road crossing.

Reconstructing the ford will allow for better passage of high water, minimize the risk of further flood damage to the road and keep the road in long-term service with minimal maintenance at this stream crossing.

2B. Location/ (Suitable) Sites: Former location of Hicks Summit Bridge on Road #745 in Meadow Creek Canyon. See Appendix IV, Watershed Treatments Map.

2C. Design/Construction Specifications:

1. Excavate the riprap material already in the channel and stockpile on site.
2. Excavate channel banks and bottom approximately 12 to 18 inches. Excavated width should be approximately the same width as the road template.
3. Place the stock piled and additional riprap into the excavated portion of the channel and banks (road approaches), blend smoothly with the lip of the road on each side of the crossing, as well as the upstream and downstream channel bottom.
4. May need an additional 6 to 12 cubic yards of small rip rap, available locally, to armor the approaches.
5. Work should take 1 to 2 hours to complete.
6. This specification can be done in conjunction with Specification #3, Inspect and clean culverts and one bridge, so there should be no further mobilization costs for this specification.

2D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To improve post fire storm runoff and prevent damage to road segments above and below crossings; and to minimize unacceptable lateral bank erosion and the possibility of the stream relocation to a less stable location to prevent water quality impairment.

2E. Treatment consistent with Agency Land Management Plan (identify which plan): Humboldt National Forest Land Resource Management Plan.

2F. Treatment Effectiveness Monitoring Proposed: See Specification 5, Post-storm Road Patrol and Maintenance.

Specification # 3 Upsize Culverts

3A. General Description: Several stream crossings drain steep watersheds that are prone to flash flooding, washout, and deposition of mud. Nine (9) culverts along FS system roads within the burned area were determined during the BAER field assessment to be undersized for potential post-fire runoff events. This project will replace nine culverts with larger culverts in order to pass storm flow with minimal to no damage to the roads. Stabilization of road crossings would reduce sediment into downstream redband and bull trout habitat. Improved road-stream crossings will provide for aquatic organism passage, which will improve aquatic habitat connectivity.

3B. Location/(Suitable) Sites: Three (3) culvert sites on Road #745; three (3) culvert sites on Road #751; two (2) culvert sites on Road #067; and one (1) culvert site on Road #668. For exact locations, see Appendix IV, Watershed Treatments Map.

3C. Design/Construction Specifications:

1. FS engineer will do design work for each of the 9 sites and will oversee project work by contractor such that the replacement culverts are properly set at the right depth and aligned with the stream channels at the inlets and outlets.
2. FS Implementation Leader will develop the contract and review the job sites for adherence to the contract.
3. FS Archeologist will use engineer's design showing changes in culvert alignment, length and width and staging areas at each site to conduct archeological survey before contract work begins; and obtain clearance from SHPO.
4. Contractor will direct the site work.
5. Contractor will use a backhoe to remove undersized culverts from roadbed. Removed culverts are not to be left on site, but carried to warehouse where they can be either reused or scrapped.

3D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To upsize culvert capacity to handle post-fire increased flows and possible flood flows in order to protect roadbeds and motorists.

3E. Treatment consistent with Agency Land Management Plan (identify which plan): Humboldt National Forest Land Resource Management Plan.

3F. Treatment Effectiveness Monitoring Proposed: See Specification 5, Post-storm Road Patrol and Maintenance. These nine new culverts will be included in the road patrol specification for proper functioning and condition.

Specification #4 Inspection/Cleaning of Culverts/ Bridges

4A. General Description: Several stream crossings drain steep watersheds that are prone to flash flooding, washout, and deposition of mud or rock. Several culverts in need of maintenance were documented during the BAER field assessment. Floatable woody debris from a pre-fire storm runoff event is deposited on the upstream side of a bridge within the burned area. This project will inspect the condition of existing culverts to process flows and then clean debris and sediment out of catch basins and culvert inlets and outlets that are clogged. This project will also remove the woody debris from the channel near the bridge so that it does not re-mobilize and cause a logjam under the bridge.

4B. Location/ (Suitable) Sites: Conduct culvert inspections and cleaning along all FS system roads (#067, #745, #750 and #751) in the Wildhorse Zone of the Murphy Fire burned area. The bridge is located on Road #067 in Meadow Creek Canyon just below Sand Creek. See Appendix IV, Watershed Treatments Map for detailed site locations.

4C. Design/Construction Specifications:

1. FS personnel will direct the work.
2. Remove woody debris around catch basins, from channels upstream or downstream from culverts and from the stream above the Road #067 bridge.
3. Use a backhoe or backhoes to remove debris and fill (rocks, sand and mud) from catch basins and culvert inlets and outlets.
4. Shovel and flush debris and fill from culverts.
5. Place all excess material outside of bank-full channel where it cannot re-enter stream channels.
6. The emergency stabilization recommendation for the bridge on Road #067 is to keep all logjams from blocking the upstream side of the bridge. This is accomplished by performing storm patrols during or after high intensity storm events and after the start of spring snowmelt. (See Specification #5, Post-storm Road Patrol and Maintenance)

4D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To maximize bridge, culvert and channel capacity to handle post-fire increased flows and possible flood flows and to protect road beds, the bridge structure and motorists.

4E. Treatment consistent with Agency Land Management Plan (identify which plan): Humboldt National Forest Land Resource Management Plan.

4F. Treatment Effectiveness Monitoring Proposed: See Specification 5, Post-storm Road Patrol and Maintenance for additional monitoring of sites.

Specification # 5 Post Storm Road Patrol and Maintenance

5A. General Description: : Roads in the Wildhorse Zone of the Murphy Fire Complex primarily follow river bottoms, passing through long narrow canyons in several places, and cross long steep slopes in and out of the canyons. There is an immediate and future threat to travelers along the roads within the burned area due to the increased potential for rolling or falling rocks, 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 at drainage facilities (culverts) or stream crossings. These events make for

hazardous access along steep slopes and put the safety of users at risk. (See Specification 12, Install and replace safety signs.)

5B. Location/(Suitable) Sites: Roads #067, #745, #750, #751 and access to power line from Road #751, 067 for maintenance. Approximately 220 miles of FS system roads. See Appendix IV, Watershed Treatments Map for road locations within the burned area.

5C. Design/Construction Specifications:

1. FS personnel will direct the work.
2. Immediately upon receiving heavy rain and spring, snowmelt the FS will send out patrols to the Wildhorse Zone burned area 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.
3. Immediately after road patrols mechanically remove any obstructions from the roads and culvert inlets and catch basins.
4. Immediately after road patrols mechanically shovel and flush debris and fill from culverts. Place all excess material outside of bank-full channel where it cannot re-enter stream channels.
5. Five patrols are anticipated – two in 2007 and three in 2008.

5D. Purpose of Treatment Specifications (relate to damage/change caused by fire): The purpose of the monitoring is to evaluate the condition of roads for vehicle access and to identify and implement additional work needed to maintain and/or repair damage road surface and flow conveyance structures across roads in order to provide safe access across FS lands. Engineering personnel will survey the roads within the fire perimeter after high-intensity summer thunderstorms in 2007 and 2008 and spring 2008 snowmelt. Survey will inspect road surface condition, ditch erosion, and culverts/inlet basins for capacity to accommodate runoff flows.

5E. Treatment consistent with Agency Land Management Plan (identify which plan): Humboldt National Forest Land Resource Management Plan.

5F. Treatment Effectiveness Monitoring Proposed: Monitor roads and culverts after storms and snow melt for possible obstructions and damage and initiate maintenance.

Specification #6 Streambank and Road Stabilization

6A. General Description: Stabilize three segments of the road fill-slopes (up to 650 feet) along a 1.5-mile segment of Road #751, which are alongside an unnamed stream with steep gully walls. Also, improve the road drainage by installing hardened drive-thru-dips at 8 to 10 ephemeral stream crossings and/or road surface drainage pour points currently in place along that same segment of Road #751. Proposed BAER treatments include replacing road-stream crossings and livestock fencing.

6B. Location/ (Suitable) Sites: Unvegetated fill-slopes along a 1.5 mile segment of Road #751 that drains into Bruneau River. The work sites are where the stream channel edge is within 15 feet of the toe of the fill-slope. These segments will be identified on the ground by the road engineer and/or forest hydrologist. See Watershed Treatment Map, Appendix IV for the general location of stabilization work.

6C. Design/Construction Specifications:

1. The streambank stabilization would include the reshaping of the fill-slope to a minimum of a 1:1 slope angle, along with the placement of Class II riprap along the toe of the fill-slope. This is denoted as **Treatment A** in the photos, Appendix III, Soil and Watershed.
2. Install 8-10 hardened drive-thru-dips at locations identified by the design engineer and hydrologist to convey water from ephemeral channels across the road prism, or to remove surface water accumulation from the road surface. Insure that the downstream lip (transition from normal road surface to dip) of the drive-thru-dip is higher in elevation than the spillway bottom of the dip. This is denoted as **Treatment B** in the photos, Appendix III, Soil and Watershed.
3. The drive-thru-dips need to be excavated deep enough to insure that potential water flow

does not divert from the perpendicular crossing of the road prism, and runs downgrade on the road surface.

4. The drive-thru-dips need to be designed into the road in such a manner that a pick-up pulling a trailer can drive thru the dip without bottoming out on the road surface.
5. Harden the dips and road fill-slopes both along the stream/road inter-face and below the dips is necessary to insure that erosion of the road prism does not take place at the dip location. Hardening materials in the road surface location will be smaller in size (4 inch minus) than the materials used on the fill-slopes protection areas (class II riprap).
6. Seed areas of bare ground caused by the excavation activities with grass seed (used standard seed mix for Humboldt-Toiyabe NF engineering projects).

6D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Road #751 is a key transportation route between the Bruneau River and the Jarbidge River drainages. This is a cooperative management road shared between the Forest Service and Elko County. This road is the primary spring access to the Diamond A Ranch, Jarbidge, and Murphy Hot Springs from the south and east. This is due to the deep snow depth on the Bear Creek Summit Road # 748, and the spring flood potential on the main Jarbidge road # 752. A 1.5-mile road segment that is located in an ephemeral draw that drains into the Bruneau River. Currently eight ephemeral streams cross the road prism and are intercepted by a gully in the main ephemeral draw. The gully wall is immediately adjacent to the fill-slope along approximately 650 feet of the road length. In addition, this is a direct sediment source into the Bruneau River. The sediment from this source enters the Bruneau River above resident red-band trout habitat, and probable over-wintering bull trout habitat (T&E species).

The post-fire run-off from 800+ acres that burned above the road location is expected to increase significantly for several years until the post-fire hydrologic recovery has occurred. The stream in this location occurs in the bottom of a recovering gully. The gully is located in very erodible soil conditions (sandy loams from granite). There is a very high potential for the road-fill to be eroded away due to additional stream-flow in the gully stream type. "These stream types are very sensitive to disturbance and tend to make significant adverse channel adjustments to changes in flow regime and sediment supply from the watershed." (*Applied River Morphology*, Rosgen, 1996) In addition to the increased stream-flow, eight ephemeral streams cross the road prism. The current road drainage is not adequate to accommodate the potential post-fire runoff. The stabilization improvements would accomplish two objectives: 1) the installation of 8-10 drive-thru-dips would reduce the head-cutting erosion of the road prism into the gully. 2) The spreading out of the water input into the gully will reduce the erosion power of the water flow on the fill-slopes in several locations. This would reduce the collapse of the road-fill and the amount of sediment transport into the stream system. It would also reduce the possibility of gully plugging/widening. 3) Reduce the sediment yield entering the Bruneau River and into resident Red-band Trout habitat, and probable over-wintering Bull Trout habitat.

6E. Treatment consistent with Agency Land Management Plan (identify which plan): Humboldt National Forest - Land Resource Management Plan – "To protect or improve water quality or soil productivity."

6F. Treatment Effectiveness Monitoring Proposed: The Forest Hydrologist will review the effectiveness of the treatment following any major storm events for the first year following implementation to insure the stabilization treatments are adequate to reduce sedimentation into the Bruneau River.

Protection/Safety: Specification 12

Specification #12 Install and Replace Safety Signs

12A. General Description: Five informational public safety signs were damaged as a result of the Murphy Complex: Wildhorse Zone fire and need to be replaced. These signs contain safety directions or information for the public in remote areas. Also, there will be 25 hazard warning signs developed for immediate installation on roads entering the burned area for the protection of life and

property. These signs are necessary to inform the public of immediate danger posed by flash floods, falling rocks, and washouts.

12B. Location/(Suitable) Sites: Various locations throughout the fire area to protect and inform the public. The hazard warning signs will be installed at strategic locations on main roads where hazards exist to public users. See appendix IV Watershed Treatments Map to identify key areas of concern for sign locations.

12.C Design/Construction Specifications:

1. Design and size will meet current USFS sign shop specifications and will be patterned after the originals.
2. Depending on sign type, these signs will be fastened to metal or wood posts and buried at least 3 feet in the ground.
3. FS will identify specific locations for each sign based on local knowledge and assessed needs.
4. The following wording will be used for the Hazard Warning signs:

Warning
 Entering Burned Area. Watch
 for Falling Rocks, Flash
 Floods, and Washouts. Turn
 Arouds May be Unavailable

12.D Purpose of Treatment Specifications: To provide for public health and safety by providing safety directions as well as notifying forest visitors of the possible hazards found within the burned areas.

12E. Treatment Effectiveness Monitoring Proposed: Implementation Leader will verify installation and locations and monitor continued need for the signs.

Monitoring Treatments: Specifications 7, 9, 10

Specification #7 Native American Consultation

7A. General Description: Murphy Complex: Wildhorse Zone. Pursuant to Federal cultural resource laws, Federal undertakings, including emergency stabilization that may affect significant heritage resources of religious significance or traditional cultural importance require the lead Federal agency to consult with affected tribes as equal partners. Therefore local tribes must be consulted concerning any stabilization that may occur at, on, or near historic properties of Native American origin that are located in areas subject to emergency stabilization efforts. The Duck Valley Shoshone-Paiute Tribes has been identified a consultation party having cultural concerns within the burned area.

7B. Location (Suitable) sites: Murphy Complex: Wildhorse Zone. Rock shelters, burial locations, traditional cultural properties and religious/sacred sites that may have been subject to fire effects and may have treatments proposed at, on, or near them. Such locations are exempt from public disclosure under the Archaeological Resources Protection Act and the National Historic Preservation Act.

7C. Design/Construction Specifications:

1. One field consultation meeting with a representative from the Duck Valley Shoshone-Paiute Tribes elder and the Cultural Director (representatives) to discuss treatment plans and site concerns. Additional tribal elders may be involved as appropriate.
2. Allowance is made for one field trip to follow up on specific concerns raised in the initial consultation. Tribal member travel to the field is included as part of information gathering.

7D. Purpose of Treatment Specifications: To meet consultation requirements of Federal legislation.

7E. Treatment consistent with FS Land Management Plan: Humboldt National Forest Land and Resource Management Plan, 1999, reprint with Amendments # 1 - #6.

7F. Treatment Effectiveness Monitoring Proposed: Initial consultation meeting will determine the Duck Valley Shoshone-Paiute Tribes has cultural concerns about treatment locations.

Specification #9 Noxious Weed Detection

9A. General Description: Conduct noxious weed/non-native invasive plant species detection monitoring for possible invasion on roads, hand lines, dozer lines, retardant drops, and other disturbed areas within the perimeter of the Murphy Fire Complex: Wildhorse Zone. Monitor existing noxious weed/non-native invasive plant species infestations within the burned area to determine if expansion is occurring into non-infested areas. Inventory for noxious weeds/non-native invasive plant species near existing locations and in areas that have a high probability for invasion within the burned area and prescribe treatments to control the invasion and spread of the plants.

9B. Location/ (Suitable) Sites: Monitor at known locations of noxious weeds/non-native invasive plant species. All known locations are within the Mountain City Ranger District boundaries. Inventory areas that have a high potential for weed/invasive species invasion (or as determined by FS staff). Critical areas include drainages, roads, dozer lines and burned areas where suppression vehicles and equipment traveled through known noxious weed/non-native invasive plant species populations. Monitoring and inventory sites will include but are not limited to FS Roads 745 (Meadow Creek), 751 (Trail Gulch), 067 (Bruneau Canyon), 997 (Rattlesnake Canyon), 061 (Wickiup Creek) and 750. Monitor all visible noxious weed/non-native invasive plant species along roads systems and creeks within the fire area. Estimated acreage of detection monitoring is 1,042 acres. See Vegetation Treatment Map, Appendix IV.

9C. Design/Construction Specifications:

1. Conduct detection monitoring on existing noxious weed/non-native invasive plant species populations within the burned area using protocol determined by the FS, Humboldt-Toiyabe National Forest. Monitoring to determine the post-fire presence or spread of invasive species will be conducted on existing and historical noxious weed/non-native invasive species populations within the burned area using protocols determined by the Humboldt-Toiyabe National Forest and current management plans. Detection monitoring will be conducted in areas disturbed by the fire and fire suppression activities.
2. Inventory, photo document, and map new noxious weed/non-native invasive plant species infestations within disturbed lands using Global Positioning System (GPS) technology. Enter data into the TERRA DATA BASE.
3. Initiate agency approved control measures where detection demonstrates the establishment or expansion of noxious weed/ invasive species populations. Direct treatment will occur when there is a threat to natural regeneration and recovery of native vegetation, establishment of effective ground cover, or expansion within and outside the burn area from invasive species inside the burned area.

9D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Purpose is to detect the invasion or spread of noxious weeds and non-native invasive plant species and to prescribe treatments that will control the invasion or spread. The level of monitoring required will be commensurate with the complexity of the project, level of concern, and the objectives of the plan. Monitoring and evaluation to determine the effectiveness of stabilization treatments is funded for up to three years following containment of a wildfire. Using IPM techniques will help to minimize the establishment of non-native invasive species within the burned area.

9E. Treatment consistent with Agency Land Management Plan (identify which plan): Humboldt-Toiyabe National Forest Land and Resource Management Plan and FEIS, along with Noxious Weed Control Environmental Assessment.

9F. Treatment Effectiveness Monitoring Proposed: Control and detection of noxious weeds/non-native invasive plant species in both burned and unburned areas will be monitored according to the strategy outlined in the specification. Control will be considered successful upon determination that

all noxious weeds have been controlled and non-native invasive plant species have not spread beyond their pre-fire locations. This treatment will also monitor the effectiveness of Specification #8, Noxious Weeds Treatment.

Specification #10 Monitor Vegetation Recovery

10A. General Description: Conduct critical habitat recovery monitoring during the spring/summer of 2008, to determine vegetation recovery and re-establishment in critical wildlife and plant habitat, within the perimeter of the Murphy Fire Complex: Wildhorse Zone. Recovery monitoring will occur on all disturbed plant community types within critical habitat where vegetation mortality was moderate and high to determine the need for supplemental seeding for critical wildlife habitat improvement. The FS will establish recovery criteria, i.e., plants per square foot, for each vegetation type prior to monitoring. Monitoring will also occur on one site where suppression efforts may have impacted a FS R4 Sensitive Plant Species, Lewis' buckwheat (*Eriogonum lewisii*)

10B. Location/ (Suitable) Sites: All areas of concern to the FS that may impact future resource management activities in critical wildlife and plant habitat. Monitoring plots should be located in each vegetation type to ascertain whether revegetation criteria have been met and whether additional treatments are necessary. The areas within critical habitat that have moderate and high vegetation mortality encompass approximately 19,000 acres. Areas with high vegetation mortality and high shrub mortality should be prioritized for recovery monitoring, especially in critical riparian zones. Disturbed areas within and along the fire perimeter, such as dozer lines, hand lines, and safety zones, will be prioritized for monitoring. Final site selections to be made by FS resource specialist. A potential suppression impact to a FS R4 sensitive plant species (Lewis' buckwheat (*Eriogonum lewisii*)) may have occurred in Sections 32, 33, 34 and 35, T47N, R57E, and MDM. The dozer line impacts are approximately 2 ½ miles in length. The monitoring of this suppression impact should receive priority before further damage occurs from public usage of the dozer line for access to forestlands.

10C. Design/Construction Specifications: Monitoring transects shall be established and methodologies designed to determine:

1. Vegetative cover and density will be monitored in late spring of 2008, and in late summer of 2008. At least one monitoring location will be established for each vegetation type of concern within polygons of high and moderate vegetation mortality-in each vegetation type within critical habitat and in areas of known locations of critical wildlife species. Sagebrush communities are especially critical due to presence of sage grouse and pygmy rabbit. The monitoring locations will be in representative areas that are not transitional from one vegetation-monitoring stratum to another, using local agency specified methods.
2. Sampling should determine species composition and density.
3. Monitor cover of vegetation, litter, rock, bare ground and cryptogamic crusts.
4. Cover sampling methodologies, as referenced in BLM Technical Reference 1730-1, Measuring and Monitoring Plant Populations, shall represent dominant plant community type, aspect, and slope variations within the fire area. Photos shall accompany data records as supporting documentation of findings.
5. Observations should be documented both in written and photographic documents to record other factors such as herbivory, surface erosion, etc.
6. Continuous surveys in years 2 and 3 will also aid in further detection and minimize spread.
7. Annual monitoring reports shall be published that document sampling methodologies, techniques, areas sampled, and summary of findings.
8. Look at impacts to a R4 sensitive plant species (Lewis' buckwheat (*Eriogonum lewisii*)) from the dozer line in Sections 32, 33, 34, and 35, T47N, R57E, and MDM. Monitor the impacts and prepare a recovery plan for the species, if necessary, using fire suppression funding. Monitoring for the impacts to this species will be prioritized over any other monitoring planned.

10D. Purpose of Treatment Specifications (relate to damage/change caused by fire):

Monitoring of critical habitat is necessary to determine whether further vegetative treatments are

necessary to meet management goals and objectives. If recovery has not been met then additional funding requests must be prepared and submitted.

10E. Treatment consistent with Agency Land Management Plan (identify which plan):

Humboldt-Toiyabe National Forest Land and Resource Management Plan and FEIS.

10F. Treatment Effectiveness Monitoring Proposed: Monitoring is required to ascertain whether vegetative recovery of critical habitat, as anticipated, has occurred. Management decisions that will be based on the monitoring results include the need for additional treatments and the need for non-native invasive species control. Additional treatments may be proposed if monitoring concludes that the criteria for revegetation success are not achieved.

Cheatgrass Treatment (proposed for Interim #1, September 20, 2007)

Treat 150 acres of the highest concentrations of cheatgrass (*Bromus tectorum*), which occur in "patches" at the northern end of the fire, with an herbicide (Plateau™). Plateau™ has been effective on the Humboldt-Toiyabe National Forest (H-T) as a treatment for invasive grasses, such as Medusahead (*Taeniatherum caput-medusae* L) and cheatgrass. It is most effective when followed by seeding to limit the reestablishment of the invasive weed. Therefore, seed herbicide treated areas with the appropriate native grass seed mix (seed mixes are described below). The areas surrounding the herbicide treatments contain lower concentrations of cheatgrass. Seed these areas also with native grasses to increase diversity. Seed a total of 1,000 acres.

To determine the most viable seed mix for competing with cheatgrass within this burn (and future burns), three different seed mixes will be used. Seed 100 acres with sterile ryegrass and another 100 acres with a warm season grass mix that has a lower precipitation requirement than the average for the area. The purpose of the warm season mix is to provide for a seasonally warmer, dryer climate regime in an area that appears to be moving toward a warmer, dryer climate. Seed the remaining 800 acres with a standard seed mix adapted for this area and selected to compete with cheatgrass. The grasses in this mix are all native to Nevada and Idaho. Monitor the success of each seed mix. Results will determine which mix best will be used for potential follow-up treatments. If it is determined additional seeding is required, an interim request for funding will be submitted.

Desert "Warm Season" Seed Mix: (Seed prices quoted from the Great Basin Seed, LLC web site: <http://greatbasinseeds.com/>)

Plant Species	Seeding Rate (lb. PLS*/acre)	Pure Live Seeds per Pound*	Estimated Cost of PLS/Lb.**	Pure Live Seed Per Foot ²	Total Cost of PLS for 100 Acres
Alkali sacaton (<i>Sporobolus airoides</i>)	1 lb.PLS/ac	1,750,000	\$7.00	40.17	\$700
Blue grama (<i>Bouteloua gracilis</i>)	5 lb.PLS/ac	724,400	\$5.50	83.15	\$2,750
Sand dropseed (<i>Sporobolus cryptandrus</i>)	2 lb.PLS/ac	5,600,080	\$5.00	257.12	\$1,000
Purple threeawn (<i>Aristida purpurea</i> var. <i>longiseta</i>)	3 lb.PLS/ac	500,000	\$24.00	34.44	\$7,200
TOTAL	11 lb/ac			42.84	\$11,650

Sterile Annual Seed: (Seed prices quoted from the Great Basin Seed, LLC web site: <http://greatbasinseeds.com/>)

Wheat X Cereal Rye - 13,000 PLS/lb. @ \$4.00/lb. & 12/lbs/ac @ 100 acres = **\$ 4,800**

Standard Seed Mix: (Seed prices are quoted from Bill Agnew at Granite Seed Company, North Lehi, and UT)

Plant Species	Seeding Rate (lb. PLS*/acre)	Pure Live Seeds per Pound*	Estimated Cost of PLS/Lb.**	Pure Live Seed Per Foot ²	Total Cost of PLS for 800 Acres
Bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>)	5 lb.PLS/ac	125,680	\$6.00	14.43	\$24,000
Indian ricegrass (<i>Achnatherum hymenoides</i>)	4 lb.PLS/ac	161,920	\$5.00	14.87	\$16,000
Western wheatgrass (<i>Pascopyrum smithii</i>)	5 lb.PLS/ac	118,000	\$5.00	13.54	\$20,000
TOTAL	11 lb/ac			42.84	\$60,000

Because the seeding areas are steep and rocky, it is not possible to drill seed. The seed must be applied aerially. Use a helicopter instead of a fixed wing aircraft to achieve better control of seed application and to allow for onsite loading of the seed mix. Aerial application by helicopter is estimated to cost \$8,000 (based on similar work recently completed by the local BLM office at a unit cost of \$8.00 per acre).

Effectiveness monitoring on the H-T's 2003 South Sage Fire indicated that aerial application can be a suitable method for seeding native grasses on the Forest (Howell, 2005). Test plots of the seeding indicated successful establishment of native seed vegetation, and contained less than 0.1% cheatgrass two years after the fire. A study of the 1999 Railroad Fire in Tintic Valley, Utah, by Thompson and others (May 2006) also showed effective use of aerial seeding of native grasses with limited cheatgrass encroachment.

Apply the herbicide using District weed crew and Forest-owned equipment. Material costs are limited to the cost of the spray itself:

Plateau™ Herbicide	9.5 gallons x \$277 per gallon = \$2,631.50
Surfactant	20 gallons x \$15 per gallon = \$300.00

Use a four person implementation team for seeding and herbicide application (estimated cost \$6,890.85). To prevent damage to sensitive cultural sites, the District archeologist will monitor the area prior to implementation (estimated cost \$2,087.80). Monitor the success of the cheatgrass treatment during the 2008 field season (estimated cost \$2,200.00).

I. Monitoring Narrative: Treatment effectiveness monitoring was described for each treatment in the previous section. In addition, a separate monitoring specification for monitoring critical habitat was prepared (#10).

A. 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.

B. Noxious weed monitoring will occur at least once in early summer and once in fall to prevent weeds from maturing in the burned area. Monitoring levels may be increased if weeds are detected. If additional monitoring of treatments is necessary beyond 1 year, an interim 2500-8 request will be submitted. A monitoring report following the first year monitoring results will be submitted before any interim requests are made.

C. Monitoring for invasive weeds will be conducted in the spring of 2008 to assess the potential for cheatgrass invasion and dominance on the lower benches of the burn area. If initial assessments indicate

that further surveys are needed to assess the effectiveness of treatment and need for re-treatment, the Forest will request additional funds at that time.

D. Monitor for impacts to a R4 sensitive plant species (Lewis' buckwheat (*Eriogonum lewisii*) from the dozer line in Sections 32, 33, 34, and 35, T47N, R8E, and MDM. If initial assessments indicate that further work is needed for the recovery of this species at this location, the forest will prepare a recovery plan using fire suppression funding. Monitoring is also required to ascertain whether vegetative recovery of critical habitat, as anticipated, has occurred.

Part VI – Emergency Stabilization Treatments and Source of Funds (Initial Request - approved 8/16/07)

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands			All Total \$
			# of Units	BAER \$		# of units	Fed \$	# of Non Fed Units	
A. Land Treatments									
#8 Treat Noxious Weeds	acres	120	704	\$84,480	\$0		\$0	\$0	\$84,480
#11 Protective Fencing	miles	9,528	13	\$123,864	\$0		\$0	\$0	\$123,864
<i>Subtotal Land Treatments</i>				<i>\$208,344</i>	<i>\$0</i>		<i>\$0</i>	<i>\$0</i>	<i>\$208,344</i>
B. Channel Treatments									
<i>Subtotal Channel Treat.</i>									
C. Road and Trails									
#2 Hicks Ford Improvement	each	500	1	\$500	\$0		\$0	\$0	\$500
#3 Upsize Culverts	sites	5,134	9	\$46,206	\$0		\$0	\$0	\$46,206
#4 Inspection/Cleaning of Culverts/Bridges	sites	523	20	\$10,460	\$0		\$0	\$0	\$10,460
#5 Post Storm Road Patrol & Maintenance	miles	4,627	5	\$23,135	\$0		\$0	\$0	\$23,135
#6 Streambank & Road Stabilization	acres	4,307	10	\$43,070	\$0		\$0	\$0	\$43,070
<i>Subtotal Road & Trails</i>				<i>\$123,371</i>	<i>\$0</i>		<i>\$0</i>	<i>\$0</i>	<i>\$123,371</i>
D. Protection/Safety									
#12 Install & Replace Signs	each	223	30	\$6,690	\$0		\$0	\$0	\$6,690
<i>Subtotal Structures</i>				<i>\$6,690</i>	<i>\$0</i>		<i>\$0</i>	<i>\$0</i>	<i>\$6,690</i>
E. BAER Evaluation									
BAER Plan				\$167,562			\$0	\$0	\$0
BLM Consult				\$29,570					
<i>Subtotal Evaluation</i>				<i>\$197,132</i>	<i>\$0</i>		<i>\$0</i>	<i>\$0</i>	<i>\$0</i>
F. Monitoring									
#7 Native American Consultation	each	2,049	1	\$2,049	\$0		\$0	\$0	\$2,049
#9 Noxious Weed Detection	acres	12.48	1042	\$13,004	\$0		\$0	\$0	\$13,004
#10 Monitor Critical Habitat	acres	1.35	19,400	\$0	\$0		\$0	\$0	\$0
<i>Subtotal Monitoring</i>				<i>\$15,053</i>	<i>\$0</i>		<i>\$0</i>	<i>\$0</i>	<i>\$15,053</i>
\$550,590									
G. Totals				\$353,458	\$0		\$0	\$0	\$353,458
Previously approved									
Total for this request				\$353,458					

Part VI (continued) – Emergency Stabilization Treatments and Source of Funds (Interim #1)

			NFS Lands				Other Lands				All
		Unit	# of		Other		# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER \$	\$		units	\$	Units	\$	\$
A. Land Treatments											
Herbicide spray	acres	19.54	150	\$2,931	\$0			\$0		\$0	\$2,931
Seeds & Seed Application	acres	84.45	1000	\$84,450	\$0			\$0		\$0	\$84,450
Implementaton Crew of 4	each	6890.95	1	\$6,891	\$0			\$0		\$0	\$6,891
Subtotal Land Treatments				\$94,272	\$0			\$0		\$0	\$94,272
B. Channel Treatments											
Subtotal Channel Treat.											
C. Road and Trails											
				\$0	\$0			\$0		\$0	\$0
				\$0	\$0			\$0		\$0	\$0
				\$0	\$0			\$0		\$0	\$0
				\$0	\$0			\$0		\$0	\$0
				\$0	\$0			\$0		\$0	\$0
Subtotal Road & Trails				\$0	\$0			\$0		\$0	\$0
D. Protection/Safety											
				\$0	\$0			\$0		\$0	\$0
Subtotal Structures				\$0	\$0			\$0		\$0	\$0
E. BAER Evaluation											
								\$0		\$0	\$0
Subtotal Evaluation				\$0	\$0			\$0		\$0	\$0
F. Monitoring											
Cultrual Resources	each	2,087.80	1	\$0	\$0			\$0		\$0	\$0
Cheatgrass Treatment	each	2,200.00	1	\$2,200	\$0			\$0		\$0	\$2,200
				\$0	\$0			\$0		\$0	\$0
Subtotal Monitoring				\$2,200	\$0			\$0		\$0	\$2,200
\$96,472											
G. Totals				\$96,472	\$0			\$0		\$0	\$96,472
Previously approved				\$0							
Total for this request				\$96,472							

PART VII - APPROVALS

Initial Signatures:

1. /s/Edward Monnig
(signature)
Edward Monnig, Forest Supervisor

August 09, 2007_____

Date

2. /s/ Jack G. Troyer
(signature)
Jack Troyer, Regional Forester

8/16/07

Date

Interim Signatures:

1. _____
Forest Supervisor (signature)

Date _____

Date

2. _____
Regional Forester (signature)

Date

Date _____

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