

Date of Report: 7/10/08

BURNED-AREA REPORT
(Reference FSH 2509.13)



PART I - TYPE OF REQUEST

A. Type of Report

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

B. Type of Action

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
- ☐ 2. Interim Report # _____
 - ☐ 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: Elkhorn II
- B. Fire Number:
- C. State: NV
- D. County: Washoe
- E. Region: 4
- F. Forest: Humboldt-Toiyabe
- G. District: Tonopah RD
- H. Fire Incident Job Code P4D72Y
- I. Date Fire Started: June 14, 2008
- J. Date Fire Contained: June 24, 2008
- K. Suppression Cost: 1.3 million
- L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 1 mile
 2. Fireline seeded (miles): 0
 3. Other (identify): County Rd. 006 will be repaired and graveled; the county is donating the gravel and their labor.
- M. Watershed Number: 6 field HUC, 160600110402
- N. Total Acres Burned: 6189 Wildfire Use Acres 0 Wildfire Acres 4342
NFS Acres (6189) Other Federal () State () Private ()
- O. Vegetation Types: Single-leaf pinyon, Utah juniper, black sage, Indian ricegrass, pine needlegrass and western needle grass
- P. Dominant Soils: Alluvial soils are mainly Gochea and Zadvar soils. The soils are Argiduridic Argixerolls and shallow Haploxerollic Duriargids (obsolete name). The steep mountainous slopes are composed of Cropper, Suak, and Squawtip soils. These soils are mainly Typic and Lithic Argixerolls.
- Q. Geologic Types: Granite
- R. Miles of Stream Channels by Order or Class:
Perennial 1.75 mi Intermittent 2.25 mi Ephemeral 14 mi
- S. Transportation System
Trails: 0 miles Roads: 1.25-mile interior, 3 perimeters

PART III - WATERSHED CONDITION

- A. Burn Severity (acres): 924 (low) 3127 (moderate) 169 (high)
- B. Water-Repellent Soil (acres): 1730 total 1561 (moderate) 169 (high)
[Locally higher on the steeper aspects and lower on the flats]
- C. Soil Erosion Hazard Rating (acres): _ (low) _ (moderate) predominantly (high). Slopes greater than 15 are rated as high; slopes less than 15 have a moderate rating.
- D. Erosion Potential: tons/acre 924 (< 1 t/a) (low) 1920 (1t/a slopes < 50%), 1207 (4t/a slopes > 50%)
(moderate) 169 (4-6 t/a) (high)
- E. Sediment Potential: _cubic yards / square mile 1072

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):	<u>3-10</u>
B. Design Chance of Success, (percent):	<u>80</u>
C. Equivalent Design Recurrence Interval, (years):	<u>25</u>
D. Design Storm Duration, (hours):	<u>3</u>
E. Design Storm Magnitude, (inches):	<u>1.35</u>
F. Design Flow, (cubic feet / second/ square mile):	<u>196 cfs</u>
G. Estimated Reduction in Infiltration, (percent):	<u>0</u>
H. Adjusted Design Flow, (cfs per square mile):	<u>196 cfs</u>

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Homes, structures, roads, trails and public safety:

Homes -There are no private in-holding and/or private properties or developments located in the fire perimeter or within the watershed, the Elkhorn Fire burned in. Therefore, risk to property does not exist within the burn area. However, there is an increased risk to life from recreational use of the area during wind erosion and landslide events.

Roads and trails – The burn is close to roads used by local ranchers, recreationists and hunters. Water-borne erosion from this burn may affect these roads by washing them out. Wind erosion may reduce visibility.

Public safety – The greatest risk to public safety is loss of visibility during wind erosion events and risk of landslides. There are about 4 miles of roads within the burn area. A preexisting tendency for landsliding along Forest Service System road 093 has been increased by the loss of vegetation and complete consumption of ground cover and litter.

Water quality:

There is a risk of sediment transport from the fire into the drainage net work however, this is not a municipal watershed, there are no domestic water uses and the stream is not a fishery. Increased turbidity is the most likely water quality impairment. Duration of impact 3 to 10 years.

Ecosystem stability:

The fire burned almost all of the existing vegetation, roots and organic matter from the soil surface layer resulting in a reduction in soil productivity and moisture holding capacity. This combined with the high sand content and an associated lack of soil surface structure makes the soils at a high risk for erosion.

The loss of the sparse cover of perennial understory plants, as well as the trees, opens the site to invasion by weedy annuals such as cheatgrass and noxious weeds. Without an adequate cover of desirable perennial species, the site could become ecologically barren and a future fire hazard.

In areas where fire burned at high to moderate intensity within the high density pinyon-juniper there is a high probability the site will convert to an annual grass (cheatgrass) and annual forb (tansymustard, tumbledustard, alyssum) dominated community. If the site were to convert to annuals, it would become susceptible to repeated fires. The recommended treatment will minimize the threat to ecosystem stability and with the establishment of

perennial grasses and forbs, there will be the additional benefit that the treated area could serve as a fuel break for adjacent fires.

Wildlife:

Prior to the fire, this area had already converted from a sagebrush-dominated system to a pinyon-juniper dominated system. These closed canopy systems have shaded out grasses and forbs so the potential for recolonization from residual or adjacent seed sources is greatly diminished. Concerns for wildlife impacts are mostly in the area of invasive weeds or annuals that may become established. The risk for potential spread of cheatgrass (*Bromus tectorum*) further threatens the reestablishment of native grasses, forbs and sagebrush.

Wildlife species that could be temporarily impacted by the fire are mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), badger (*Taxidea taxus*), ground squirrel (*Spermophilus* spp.), and migratory birds including but not limited to black-throated gray warbler (*Dendroica nigrescens*), pinyon jay (*Gymnorhinus cyanocephalus*), Northern flicker (*Colaptes auratus*), and Northern goshawk (*Accipiter gentilis*).

There are no threatened or endangered wildlife species within the fire area. Mule Deer occupy the project area. Some temporary displacement of individuals will likely occur however; similar habitat is abundant in the surrounding area and will provide ample dispersion area for individuals until the burned area recovers.

Soil Productivity:

Most of the pinyon woodland dominated area burned at moderate to high intensity. Approximately 3 percent of the fire burned at high severity, 50 percent burned with moderate severity. Steeper slopes that had 40 to 50 percent rock cover, a patchy woodland community with less ground fuels burned at lower intensity. Hydrophobicity transects in the Northwestern portion of the burn showed both the “high intensity” and “moderate intensity” had similar hydrophobic. A transect conducted on 35 percent slopes with a 210 degree aspect resulted in all soils having some degree of hydrophobicity with a depth ranging from 1 to 4 cm deep. All five plots had exhibited high hydrophobicity in at least 55 percent of the sample area. The opposite slope (100 degree aspect) while steeper had less vegetation, there hydrophobicity in 40 percent of the sample area rated low to moderate. Residual vegetation was approximately (1-2 percent) in this area. The lower gradient slopes on the southeast side of the fire showed similar consumption. Surface hyphobicity was lower on the southeast side with only 35 percent showing high hydrophobicity and 20 percent moderate. Hydrophobic depth was no more than 1.25 cm. Soil productivity will be negatively impacted from the complete consumption of surface organic matter and the loss of root structure to hold the soil in place. Soils throughout the fire are rated as highly erosive, loss of existing ground cover as well as potential future inputs will result in increased soil erosion and loss.

Due to the coarse nature of the soils, the suite of grasses is dominated by Indian ricegrass (*Achnatherum hymenoides*) and needlegrasses including pine needlegrass (*Achnatherum pinetorum*), western needlegrass (*Achnatherum occidentale*) and needle and thread grass (*Hesperostipa comata*). Additional grasses found in adjacent unburned areas include Sandberg’s bluegrass (*Poa secunda*) and squirreltail (*Elymus elymoides*). Due to soil and climatic conditions, this area is not suited for growing wheatgrasses and ryegrasses.

Noxious weeds:

Noxious weed surveys conducted by the Forest Service identified populations of cheat grass. The northeast end the fire encroached into an area that burned three years prior. A portion of this previous burn was in and intermittent stream riparian area and the remainder in a low gradient slope. Basin wildrye and Douglas sedge were returning to the more moist riparian sites, but the dryer slopes were primarily cheatgrass (*Bromus tectorum*), desert alysium (*Alyssum desertorum*) and tansymustard (*Descurainia* spp.). Without a seed source, much of the current burn would also convert to weedy annuals.

Although no noxious weeds were found in the burned area the site was previously treated for musk thistle (*Carduus nutans*). Noxious weed populations could increase after the fire.

B. Emergency Treatment Objectives:

1. Reduce hazards to the public

2. Control expected invasion by cheatgrass and other annuals through application of seed mix.
3. Minimize the expected soil erosion through a seed mix that includes herbaceous and shrubby plants adapted to sandy soils and desirable annual forbs capable of immediately competing with invasive annuals, such as cheatgrass.
4. Control possible invasion by musk thistle or other noxious weeds.

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

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

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	85	90
Channel	NA		
Roads/Trails	NA		
Protection/Safety	90	90	

E. Cost of No-Action (Including Loss): \$860,263.00

F. Cost of Selected Alternative (Including Loss): 144,504 with unmitigated loss 782,959

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Barbara Drake

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Phone: 775-355-5339

FAX: 775-355-5399

H. Treatment Narrative:

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

Land Treatments:

Aerial seeding and chaining - With the need to ensure the seed stays in contact with the loose soil, the proposal is to aerial seed and immediately afterward perform contour chaining in designated areas through 800 acres burned by the wildfire. Treatments will occur on low gradient slopes where pinyon-juniper encroachment and high burn intensity has reduced the capability of the site to recover on its own. Although drill seeding would

be preferred for burying the seed, numerous standing dead trees prohibit equipment travel. Survey of existing Heritage resources would be necessary to implement the treatment.

Ryan Shakespeare, a reclamation specialist for the Cedar City BLM District was consulted. He said they have had good response with aerial seeding followed by chaining in burned arid sites with pinyon-juniper. The chaining covers the soil and the down trees provide a micro-climate for seed establishment and help hold the soil. He also said they had seeded Indian ricegrass (*Achnatherum hymenoides*), which is in the proposed seed mix, in sandy soils under this treatment and had good success. Thompson (2002) found that Neespar Indian ricegrass (*Achnatherum hymenoides*) proved to be the most successful species in native seed mixes used in west central Utah.

Data from the Cove Mountain Fire Vegetation Monitoring Report from the Pine Valley Ranger District of the Dixie National Forest indicates that chaining following aerial seeding can reduce the relative frequency of cheatgrass and other annuals and increase the success of seeded species in the year following treatment (Madsen 2007).

Cheatgrass control was assessed using aerial seeding followed by chaining and aerial seeding alone on burns in west central Utah, and chaining pinyon-juniper after aerial seeding was shown to be effective in creating the appropriate micro-climate and seed bed conditions for establishment of perennial vegetation as compared to aerial seeding alone (Ott et al. 2003).

In pinyon-juniper chainings in eastern Nevada, during the first two years following treatment the sites were dominated by annual and perennial forbs (Tausch and Tueller 1977). Burn studies completed on the Forest have found this to hold true for many of the burned areas on the Humboldt-Toiyabe National Forest, yet most of our seed mixes consist almost completely of grass species. In this fire, with an almost complete lack of plants remaining and a demonstrated tendency to convert to annual forbs and grasses after burning, I believe there is a need to include rapid growing annual and perennial forbs as well as perennial grasses to compete with invasive species. Although there is not much research on the use of forbs, there has been a lot of recent effort to develop forb cultivars for taking advantage of these competitive niches in seed mixes (Shaw, et al. 2005).

We propose to use a mixed native seed and short-lived non-native seed mix to achieve both rapid short-term growth and long-term survival. A seed mixture higher than usual in short-lived forbs was chosen, since forbs are usually the first plants to come back on a site, and dominance by annual weedy forbs and cheatgrass is a high possibility on this burn. In this area a fast growing ground cover is a top priority to provide protection for the soil surface and competition from invasive annuals until the slower growing, but deeper rooted species can establish. Four-wing saltbrush was added to the seed mix as it is most commonly found on well-drained sandy to rocky soils, the seedlings on favorable sites show rapid growth and this plant has been shown to effectively compete with cheatgrass. Four-wing saltbrush will grow 1 to 1.5 inches in the first year and become established in 3 to 4 years (Howard 2003). In our more arid sites this type of growth, even in the first two years would help prevent the site from being dominated by weedy annuals.

At \$20 per acre to aerially seed and \$40 per acre to chain (cost estimates from personal communication with Ryan Shakespeare), the cost would be \$48,000. Archaeological surveys are estimated at \$20 per acre for a "flag and avoid" located cultural sites survey for a total of \$16,000. Cultural survey cost estimates are from Humboldt-Toiyabe Archaeologist Alyce Branigan.

As per Forest Service protocol, livestock will not be permitted to graze on the seeded area for at least two years following treatment. Wild horses are present nearby and may become a problem within the seeded area. The livestock grazing permittee has said he will keep his cattle out of the burn during the recovery phase. The site will need to be monitored for wild horse and livestock use and fenced if necessary.

This area will need to be monitored for noxious weeds at a cost of \$2000 per year for two years. Monitoring for seeding success will be \$3000 per year. The proposal is to monitor the site for 2 to 3 years to assess treatment success. The following information will be collected as per the Forest Service National Technology Center: nested vegetative frequency or density, ground cover and vegetative cover.

The following is an estimated cost for the seed mix using information supplied by Bill Agnew of Granite Seed Company:

Species	seeds/lb	lb/acre	seed/ft2	\$/pls	amount
<i>Achnatherum hymenoides</i> (Nezpar)	161,920	1	3.72	14.00	14
<i>Bouteloua gracilis</i> (Bad River)	724,400	0.5	8.31	11.00	5.5
<i>Sporobolus cryptandrus</i>	5,600,080	0.5	64.28	8.00	4
<i>Poa secunda</i> (Sherman)	1,046,960	1	24.03	14.00	14
<i>Hesperostipa comata</i>	137,857	0.2	0.63	50.00	10
<i>Leymus cinereus</i> (Trailhead)	130,000	0.3	0.90	7.00	2.1
<i>Eschscholzia mexicana</i>	850,000	0.2	3.90	25.00	5
<i>Sanguisorba minor</i>	48,745	0.5	0.56	2.75	1.375
<i>Baileya multiradiata</i>	1,060,000	0.1	2.43	75.00	7.5
<i>Linum lewisii</i>	294,848	0.5	3.38	16.00	8
<i>Penstemon eatonii</i>	900,000	0.3	6.20	32.00	9.6
<i>Penstemon pachyphyllus</i>	227,600	0.1	0.52	32.00	3.2
<i>Gaillardia pulchella</i>	238,144	0.2	1.09	16.00	3.2
<i>Atriplex canescens</i>	44,203	0.3	0.30	11.00	3.3
<i>Ephedra viridis</i>	23,545	0.1	0.05	22.00	2.2
TOTAL		5.8	120.33	\$92.98	1400 acres
SEED COST TOTAL					\$ 130,172.00

Land Treatment Alternative considered but not selected

Treatment Narrative:

With the need to ensure the seed stays in contact with the loose soil, the proposal is to contour drill seed on 1400 acres in the low gradient slopes where pinyon-juniper encroachment and high burn intensity has reduced the capability of the site to recover on its own. However, the standing burned trees may prohibit drill seeding.

We propose to use a mixed native seed and short-lived non-native seed mix to achieve both rapid short-term growth and long-term survival. A seed mixture is higher than usual in short-lived forbs was chosen, since forbs are usually the first plants to come back on a site. In this area a fast growing ground cover is a top priority to provide protection for the soil surface until the slower growing, but deeper rooted species can establish. Drill seeding is expected to cost \$30 per acre. Spacing of trees would not allow for equipment operation, chaining of trees to allow operation is \$40 an acre. Archaeological surveys are estimated at \$20 an acre.

The seed mix is the same is in the chosen alternative.

As per Forest Service protocol, livestock will not be permitted to graze on the seeded area for at least two years following treatment. Wild horses are present nearby and may become a problem within the seeded area. The site will need to be monitored for wild horse and livestock use and fenced if necessary.

The site will need to be monitored for noxious weeds at a cost of \$2000 per year for two years. Monitoring for seeding success will be \$3000 per year.

Seed	\$130,165.00
Chaining	\$56,000.00
Drill	\$42,000.00
Archaeology	\$28,000.00
Monitoring	<u>\$5,000.00</u>
Total:	\$258,132.00

Channel Treatments: No treatments are being recommended.

Roads and Trails Treatments: Are not being recommended. Roads where impacted by heavy use for the suppression effort. Nye County has agreed to provide gravel and labor and the Forest Service will provide water to mitigate these impacts. Cost will be covered from suppression dollars.

Protection/Safety Treatments:

Warning Signs – Landslide hazard signs, and reduced visibility signs will be placed at strategic locations to warn the public of hazards. The Northern edge of the fire drains into House canyon resulting in a threat to the road paralleling the fire. Under the right conditions the road could be damaged or washed out by high flows coming from the fire. The public traveling that road could be caught unaware of any storm flows. Placing signs along the House/Barley canyon road, both the east and west end warning motorists of the potential danger.

I. Monitoring Narrative:

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

Noxious Weeds - The burned area will be monitored for the presence of noxious weeds. New weed locations will be documented with GPS positions and photographs. Local weed treatment crews will conduct the monitoring and treat with herbicide as necessary. 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 in the area. 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.

Cheatgrass and Musk Thistle - Monitor four (4) transects strategically placed within the burn perimeter. These transects will measure effectiveness of seeding treatment. Local or forest staff will conduct the monitoring. Each transect will be read once a year for up to three years beginning in 2007.

If the above monitoring indicates treatment has been ineffective or less than desirable, the monitoring team may decide to request additional funding to re-seed with the same or alternate seed mix. If monitoring of treatments beyond one year is needed, a justification and interim request will be submitted for year two. A monitoring report following year one results will be submitted before any requests are made for funding of monitoring in year two.

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #

Part IV - Emergency Stabilization Treatments and Control of Lands										
			NFS Lands				Other Lands			All
		Unit	# of	BAER	Other		# of	Wyden	# of	Non Fed
Line Items	Units	Cost	Units	\$	\$		units	\$	Units	\$
A. Land Treatments										
Aerial seed and chain	acres	60	800	\$48,000						
Native seed mix	acres	94.38	800	\$75,504						
Mulching	acres									
Archeology clearance	each	20	800	\$16,000						
Insert new items above this line!										
Subtotal Land Treatments				\$139,504						
B. Channel Treatments										
Insert new items above this line!										
Subtotal Channel Treat.										
C. Road and Trails										
Insert new items above this line!										
Subtotal Road & Trails										
D. Protection/Safety										
Warning signs	each	250	2	\$500						
Insert new items above this line!										
Subtotal Structures				\$500						
E. BAER Evaluation										
Team Assessment US	each									
BAER Implementation	each									
Insert new items above this line!										
Subtotal Evaluation										
F. Monitoring										
Weed detection	annual	2000	1	\$2,000						
Treatment effectiveness	annual	3000	1	\$3,000						
Insert new items above this line!										
Subtotal Monitoring				\$5,000						
G. Totals				\$145,004						
Previously approved										
Total for this request				\$145,004						

PART VII - APPROVALS

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

Date July 17, 2008

 2. /s/ William P. LeVere for
 Regional Forester (signature)

August 12, 2008
 Date



Typical burn severity on hillslopes



Low gradient slope



Burned soil to 15 centimeters under tree duff