

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

- ☒ 1. Funding request for estimated WFSU-SULT 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:** Sherwood**B. Fire Number:** NV-ELD-066 CR3U (P Code: PDCF3U)**C. State:** Nevada**D. County:** Nye**E. Region:** 4**F. Forest:** Humboldt-Toiyabe**G. District:** Ely**H. Date Fire Started:** June 25, 2006**I. Date Fire Contained:** (Not contained as of 7/20/2006)**J. Suppression Cost:** \$325,000 (estimate as of 7/1/2006)**K. Fire Suppression Damages Repaired with Suppression Funds**

1. Fireline waterbarred (miles): 2
2. Fireline seeded (miles): 10
3. Other (identify): N/A

**L. Watershed Number (HUC):** 160600141002**M. Total Acres Burned:**

NFS Acres(4,969)    BLM (2,409)    State (0)    Private (0)

**N. Vegetation Types:** On the upper slopes the fire burned in pinyon pine/juniper community type with black sage, cliffrose, desert peach, green ephedra, needle and thread grass, Sandberg's bluegrass and Indian ricegrass as understory dominants. On the lower slopes the fire burned in a black sagebrush community type with squirreltail, Indian ricegrass, needle and thread grass and galleta as understory dominants (primarily on BLM portion of burn).

There is a small area of Wyoming big sagebrush/black sagebrush community type near the northeast portion of the Forest boundary that has been seeded with crested wheatgrass, yet continues to have Indian ricegrass and needle and thread grass in the understory. A small portion of the burned area is intermittent riparian for which the vegetation is similar to the pinyon pine/juniper plant community, but includes species such as Apache plume, gooseberry currant, winterfat, snowberry and basin wildrye.

An estimated 50% of current burn, which equates to about 70% of the National Forest portion of the burn, was reburned (1997, 1999 and 2002 fires). An estimated 70% of the burned area has been reseeded after previous fires. The reburned area is primarily within the pinyon pine/juniper and black sagebrush cover types described above. Juniper encroachment is occurring on the unburned portions of this cover type.

Cheatgrass is present throughout all of the community types, but has been confined by an adequate cover of perennial species.

All the plant communities within the burn area had biological crusts within the interspaces of woody vegetation. These crusts consisted mostly of twisted moss (*Tortula ruralis*), lichen (*Psora decipiens*) and liverwort (*Riccia* sp.), which are all mid to late seral soil crust species.

**O. Dominant Soils:** Shallow calcarous loam, sandy loam, and gravelly to very gravelly loams. Parent material is alluvium derived from limestone. Surface has limestone gravel and cobble pavement in the interstitial spaces between vegetation (approximately 20-25% cover). Cryptogamic soils (biological soil crusts) were observed throughout the topographically flatter areas of the burn. (There is no published soil survey for Forest land in this area.)

**P. Geologic Types:** Cenozoic alluvium and conglomerates overlying Paleozoic limestone bedrock. Intermittent streams drain to the southeast from steep mountainous terrain with rock outcrops to an alluvial valley.

**Q. Miles of Stream Channels by Order or Class:** First order intermittent streams: 7 miles  
Second order intermittent streams: 2 miles

**R. Transportation System:** Trails: 0 miles Roads: 3 miles

### **PART III - WATERSHED CONDITION**

**A. Burn Severity (acres):** 3,564 (low) 1,405 (moderate) 0 (high)

**B. Water-Repellent Soil (acres):** 0

**C. Soil Erosion Hazard Rating (acres):** 4,969 (low) 0 (moderate) 0 (high)

**D. Erosion Potential:** (tons/acre)

Treatment	Year following the fire				
	1st year	2nd year	3rd year	4th year	5th year
Untreated	3.1	0.63	0.21	0.16	0.13
Seeded	3.1	0.40	0.16	0.13	0.13

Values were calculated by the Erosion Risk Management Tool (ERMIT), with an accuracy of plus or minus 50% (Robichaud and others, 2006).

**E. Sediment Potential:** (cubic yards / square mile)

Treatment	Year following the fire				
	1st year	2nd year	3rd year	4th year	5th year
Untreated	1,984	403	134	102	83
Seeded	1,984	256	102	83	83

Values based on results from the Erosion Risk Management Tool (ERMIT), with an accuracy of plus or minus 50% (Robichaud and others, 2006).

**PART IV - HYDROLOGIC DESIGN FACTORS**

- A. Estimated Vegetative Recovery Period, (years): 5
- B. Design Chance of Success, (percent): 80
- C. Equivalent Design Recurrence Interval, (years): 25
- D. Design Storm Duration, (hours): 6
- E. Design Storm Magnitude, (inches): 2.0
- F. Design Flow, (cubic feet / second/ square mile): 17
- G. Estimated Reduction in Infiltration, (percent): 1.1
- H. Adjusted Design Flow, (cfs per square mile): 17.2

**PART V - SUMMARY OF ANALYSIS**

**A. Describe Watershed Emergency:**

**Threats to Human Life**

Field reviews within and downstream of the burn confirmed that there are no situations where human occupancy of flood prone areas exists. Therefore, the effects of the fire do not appear to have created any significant threats to human life.

**Threats to Property**

Field reviews within and downstream of the burn confirmed that there are no situations where private property is within flood prone areas. Therefore, the effects of the fire do not appear to have created any significant threats to private property.

**Threats to Drainages**

With the exception of the Scofield Canyon drainage, field reviews within and downstream of the burn confirmed that there are no significant threats to water quality in the intermittent drainages. There will be sediment and ash output and minor, inconsequential changes to chemical quality, but the effects to on-site and downstream water quality are expected to be minor.

Vegetation within a 1.4 mile section of the Scofield Canyon drainage was burned. The canyon is prone to flash flooding during the spring, and is susceptible to down cutting and sediment movement in the absence of channel stabilizing vegetation. The Scofield Canyon drainage is "high value" habitat and, therefore, needs to be protected.

### **Threats to Habitat**

The canyon bottoms throughout the burned area represent potential habitat for *Penstemon concinnus*, an R4 sensitive species. These plants grow in barren washes and other barren microsites in pinyon/juniper/black sagebrush communities. No plants were located during the field review, but surviving roots and crowns may be present in the area. Invasion of cheatgrass into this system may have a detrimental effect on the suitability of the habitat.

### **Threats to Long-term Soil Productivity and Ecosystem Integrity**

Field reviews within the burn and within older burns in the area indicate there are significant threats to long-term soil productivity, ecosystem integrity and future fire frequency due to an almost guaranteed site conversion to cheatgrass (*Bromus tectorum*) if the burned area is not treated. The threat is due to past management of the area, primarily past heavy grazing by wild horses and livestock coupled with introduction of invasive species (cheatgrass) and fire exclusion. The extent of the threat is directly related to whether or not past burns within the area of the current fire were seeded.

The older burned areas were examined to determine the ability of the current burned plant communities to recover. Sites that were burned and not seeded in the past are heavily covered with cheatgrass and have few native perennial species returning to the ecosystem. Sites that were burned and seeded have low to moderate cover of cheatgrass and have experienced a good recovery of native perennials, as well as the apparent success of seeded plants.

The most obvious difference between the seeded and unseeded portions of the previous burned areas was that during the Sherwood Fire, the seeded areas, whether drilled or aerially seeded, did not experience the fire intensities that the unseeded or previously unburned fire areas received.

Almost all of the shrubs that grow on the burned area are resprouters and should return within the first two years and grow to a sustainable size within five years. Dominant resprouting shrubs include cliffrose, desert peach, Nevada ephedra, green ephedra, Apache plume, gooseberry current and green rabbitbrush. Shrubs that are not resprouters include black sagebrush, Wyoming big sagebrush and winterfat. Both pinyon pine and juniper are not resprouters.

Human effects to the recovery of this burn are moderate and primarily vehicle related. Visitors are primarily local ranchers, seasonal campers, hikers, hunters and recreational vehicle operators. The burned area receives moderate OHV and ATV use. Vehicles entering this area often travel through areas infested by cheatgrass, red brome and knapweed before entering the burned area.

### **Expected Recovery of Previously Seeded Versus Unseeded Acres:**

#### Seeded Areas (about 70% of NF lands in current burn):

Due to past revegetation efforts, the seeded areas that burned during this fire have retained sufficient roots, biological crust cover and unburned islands to greatly reduce concerns about their recovery. These sites have not experienced significantly altered soil productivity and are expected to recover vegetative within about 5 years.

#### Unseeded or Previously Unburned/Unseeded Areas (about 30% of NF lands in current burn):

The portions of the Sherwood burn that have not been seeded in the past are relatively barren of perennial herbaceous vegetation due to pinyon pine/juniper and cheatgrass invasion. In all the upper reaches of the burn, the understory shrub component has been reduced due to heavy cover by pinyon pine. In the lower reaches, the herbaceous, perennial, understory species have been reduced due to heavy past grazing use. The biological crust that has formed in the interspaces between woody vegetation is intact, but the absence of understory species provides extensive open niches where cheatgrass can thrive.

Unburned areas within the fire perimeter all contain low to moderate amounts of cheatgrass, which indicates there is adequate seed bank for this species to create extensive stands of this invasive. This

invasion will result in very poor range land condition, increased fire frequency, and associated loss of long-term soil productivity.

### Threats to Heritage Resources

Review of records for historic and prehistoric sites in the area confirmed that there are no significant threats to heritage resources.

### B. Emergency Treatment Objectives:

The goal of the burned area emergency rehabilitation is to:

- Re-establish 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.
- Prevent down cutting and excess sediment movement in the Scofield Canyon stream channel.

Treatment objectives to achieve the goal are:

- Control expected invasion by cheatgrass (*Bromus tectorum*) through application of native seed mix.
- Control expected invasion by scotch thistle (*Onopordum acanthium*) through herbicide application.
- Stabilize the Scofield Canyon stream channel.

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

Land 90 % Channel NA % Roads NA % Other NA %

### D. Probability of Treatment Success:

Treatment	Years after Treatment		
	1	3	5
Land	75	85	90
Channel	80	90	100
Roads	NA	NA	NA
Other	NA	NA	NA

### E. Cost of No-Action (Including Loss): \$490,500

The no-action cost was calculated using the BAER cost/risk analysis worksheet (USDA Forest Service, 2006). Costs associated with future fire suppression and noxious weed treatment were evaluated in the analysis.

### F. Cost of Selected Alternative (Including Loss): \$460,066

The cost of the selected alternative was calculated using the BAER cost/risk analysis worksheet (USDA Forest Service, 2006). Direct costs associated with aerial seeding, channel treatments, and monitoring of noxious weeds and native vegetation regrowth 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 type="checkbox"/> Range	<input type="checkbox"/>
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input type="checkbox"/> Engineering	<input type="checkbox"/>
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input type="checkbox"/> Archaeology	<input type="checkbox"/>
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

Team Leader: Ron Hudson  
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## H. Treatment Narrative:

### Land Treatments:

Aerial seed 1,405 acres of pinyon pine/juniper/black sagebrush and black sagebrush/grass plant community types on Forest Service lands with a native seed mix to re-establish native vegetation and control cheatgrass (*Bromus tectorum*). Conduct the seeding application during November 2006, shortly before normally expected snowfall.

The grasses used in the mix, Indian ricegrass, squirreltail and Sandberg's bluegrass, are known to be present in the unburned areas within the fire. From examination of the older burns we know that aerial seeding of squirreltail and Indian ricegrass has been successful in this area. The BLM has aerielly seeded Sandberg's bluegrass in similar habitats and has had good success. The Lewis flax, is a native species that was seeded into this area in past burns. It was chosen for this seed mix, as it is a forb that quickly establishes and will help to stabilize the soils. Unburned islands within the fire should provide a seed source for additional forb species.

Seeds for these species can be difficult to obtain, especially during years with many large fires. If any of these species are unavailable, the seeding rate for the other species should be increased so that the total number of seeds per square foot is approximately 60.

Needle and thread grass was considered for this site, but due to the high cost and low availability of this seed, it was not put in the seed mix. Other grasses that have been seeded successfully in the previous burns are crested wheatgrass and bluebunch wheatgrass. Crested wheatgrass was not considered for the seed mix, as it is a non-native that would disrupt the ecological integrity and bluebunch wheatgrass was not considered, as it is not adapted to the majority of this hot, arid area. Some non-native legumes were suggested for nitrogen fixing capabilities, but were not considered. There are currently native legumes such as locoweed/milkweed, and cliffrose is a low producer of nitrogen in the soil. In this arid climate, plant biomass is naturally low, so nitrogen production most likely does not need to be enhanced, and increases in nitrogen often favor invasive species such as cheatgrass.

A sterile cover crop was considered, but was not selected. Due to heavy encroachment by pinyon pine and juniper on the National Forest, there is little perennial understory cover left to compete with the cheatgrass. The BLM considered this option for the neighboring public lands (primarily black sagebrush dominated) within the burn, but decided against it, as they felt the area was too dry to support a sterile cover crop and there were not enough native perennials to mount a defense against eventual cheatgrass invasion. The black sagebrush sites on the Forest are similar to those on the BLM, so we did not pursue it further.

The following table shows the amount of pure live seed (PLS) targeted for the 1,405 acres. The price estimates are based on a July 11, 2006 estimate from the Granite Seed Company.

Plant Species	Seeding Rate (lb. PLS*/acre)	Pure Live Seeds per Pound*	Estimated Cost of PLS/Lb.**	Pure Live Seed Per Foot <sup>2</sup>	Total Cost of PLS for 1,405 Acres
Squirreltail ( <i>Elymus elymoides</i> )	4 lb.PLS/ac	192,000	\$30.00	17.63	\$168,600
Indian ricegrass ( <i>Achnatherum hymenoides</i> )	5 lb.PLS/ac	141,000	\$4.00	16.18	\$28,100
Sandberg bluegrass ( <i>Poa secunda</i> )	1 lb.PLS/ac	925,000	\$5.00	21.24	\$7,025
Lewis blue flax ( <i>Linum lewisii</i> )	0.3 lb.PLS/ac	925,000	\$17.00	6.37	\$7,166
<b>TOTAL</b>	<b>10.3 lb/ac</b>			<b>61.42</b>	<b>\$210,891</b>

Aerial seeding was selected over less expensive seeding methods, such as ATV or range drill, because it would not disturb the soil. Soil disturbance would likely be very harmful to biological crusts on the soil surface, which are very fragile (especially when dry), as well as creating conditions that favor noxious weed establishment. A recent article (Floyd, et.al. 2006) indicates that aerial seeding with native grasses was the most effective treatment tested in pinyon/juniper woodlands for preventing invasion by noxious weeds.

Wild horses (approximately 30) are known to graze in the burned area, and could potentially threaten the success of the seeding. A temporary fence, enclosing the proposed seeding area bordering the BLM land, will be installed to exclude wild horse grazing. The northern and southern ends of the fence will tie into a temporary fence the BLM is constructing around their proposed seeding area. The BLM initially considered a roundup of the horses, but feels more horses would just replace them from nearby ranges. Prior to installation, the route of the fence will be surveyed for cultural resources.

As per Forest Service protocols, livestock will not be permitted to graze on the seeded area for at least two years after the treatment. If monitoring indicates that invasive plants, lack of recovery, or unauthorized livestock use are concerns, the timeline to reintroduce livestock grazing will be extended by one year, or until rehabilitation objectives have been met.

#### Channel Treatments:

To reduce the potential for down cutting and excess sediment movement, six temporary straw bale check dams will be placed at evenly spaced intervals across the burned portion of Scofield Canyon's main intermittent drainage.

The straw bale check dams will be constructed perpendicular to and across the entire width of the drainage channel. They are to be positioned in a shallow trench excavated to a depth of at least 6 inches and the soil tamped along the upstream face of the barrier to avoid the possibility of piping failure. The top of the end bales will be 8-12 inches higher than the top of the center spillway bale(s). At least two wooden stakes will be driven in each straw bale and into the ground at least a one foot. The straw must be certified "weed free" to prevent the introduction of weeds to the site.

Roads and Trail Treatments: None

Structures: None

### **I. Monitoring Narrative:**

#### Knapweed, et.al.

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 or 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

Monitor four (4) frequency 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 Rehabilitation Treatments and Source of Funds by Land Ownership**

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands				All Total \$
			# of Units	WFSU SULT \$		# of units	Fed \$	# of Units	Non Fed \$	
<b>A. Land Treatments</b>										
Aerial Seeding	acres	58	1,405	\$81,490	\$0		\$0		\$0	\$81,490
Seed	acres	150.1	1,405	\$210,891	\$0		\$0		\$0	\$210,891
Temporary Fence	miles	4,169	6	\$25,014	\$0		\$0		\$0	\$25,014
Implementation Team	total	8,500	1	\$8,500	\$0		\$0		\$0	\$8,500
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Land Treatments</b>				\$325,895	\$0		\$0		\$0	\$325,895
<b>B. Channel Treatments</b>										
Straw check dams	each	341	6	\$2,046	\$0		\$0		\$0	\$2,046
Implementation Team	total	3,500	1	\$3,500	\$0		\$0		\$0	\$3,500
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Channel Treat.</b>				\$5,546	\$0		\$0		\$0	\$5,546
<b>C. Road and Trails</b>										
NA				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Road &amp; Trails</b>				\$0	\$0		\$0		\$0	\$0
<b>D. Structures</b>										
NA				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Structures</b>				\$0	\$0		\$0		\$0	\$0
<b>E. BAER Evaluation</b>										
<b>Team of 2 specialist</b>	total	5,800	0	\$0	\$5,800		\$0		\$0	\$5,800
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Evaluation</b>				\$0	\$5,800		\$0		\$0	\$5,800
<b>F. Monitoring</b>										
Invasive Species	total	4,500	1	\$4,500	\$0		\$0		\$0	\$4,500
Seeding vegetation	total	3,500	1	\$3,500	\$0		\$0		\$0	\$3,500
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Monitoring</b>				\$8,000	\$0		\$0		\$0	\$8,000
<b>G. Totals</b>				\$339,441	\$5,800		\$0		\$0	\$345,241



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**PART VII - APPROVALS**

1.     /s/Robert M. Harper for EDWARD C. MONNIG                     07/21/2006  
Forest Supervisor (signature)                     Date
  
2.     /s/ William P. LeVere for                                     07/26/2006  
Regional Forester (signature)                     Date