J.Bruggink Edit 09/14/2005 **Date of Report:** Sept. 8, 2005

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[**X**] 1. Funding request for estimated WFSU-SULT funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[**X**] 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**: Grass Springs Fire

B. **Fire Number**: NV-HTF-001574

C. **State**: Nevada

D. **County:** Lander

E. **Region**: 4

F. **Forest**:Humboldt-Toiyabe

G. **District**: Austin

H. **Date Fire Started**: August 29, 2005

I. **Date Fire Contained**: Sept. 2, 2003

J. **Suppression Cost**: $480,000 (not final)

K. **Fire Suppression Damages Repaired with Suppression Funds**

1. Fireline waterbarred (miles): 1

2. Fireline seeded (miles): 0

3. Other (identify): NA

L. **Watershed Number**: 160600042004 (Simpson Park Canyon Watershed).

M. **Total Acres Burned**:

NFS Acres (391) Other Federal ( ) State ( ) Private (116)

N. Vegetation Types

Pinyon Juniper Plant Community
This plant community makes up about 304 acres or 60% of the burn area. It is located on predominately loam soils with 25-30% gravel of andesitic volcanic tuff parent material grading into silt loam with 0-1 inch organic layer. This plant community is found throughout the fire except in the flatter drainage basins.

Pinyon Pine and Juniper are the dominant plant species. Other species that occur in the surrounding plant community are: Big sagebrush, Indian ricegrass, Sandberg bluegrass, cheatgrass, and Arrowleaf balsamroot.

Big Sagebrush Plant Community
This plant community makes up about 203 acres or 40% of the burn area. It is located on predominately silty to clayey loam soils with 15-20% gravel of andesitic volcanic tuff parent material with 1-2 inch organic layer. This plant community is found in the drainage basins in the core of the burn area and at the lower (northeast) end of the drainage basin.

Big sagebrush is the dominant plant species with Rabbitbrush, Indian ricegrass, Sandberg bluegrass, and Arrowleaf balsamroot.

Threatened, Endangered, Sensitive, and Rare Plants and Habitat:
According to the District Range Conservationist, there are no Threatened, Endangered, Sensitive or Rare plants or habitat in or around the burn area.

O. Dominant Soils: The Grass Springs fire area does not have a soils inventory. Field investigations shows that this fire is situated on alluvial fan remnants and ballenas with gently sloping valley bottoms bordering and exiting the fire on the Northeast corner. Soils are predominately deep, except near the ridgeline to the west where they appear to be shallow to moderately deep, surface textures range from gravelly and very gravelly loams and sandy clay loams. Cobbles, stones, and the occasional boulder are found on the steeper side slopes.

P. Geologic Types: The upper (western) area and surrounding ridgelines have decomposed Tertiary andesitic volcanic tuff boulders, cobbles, gravels, sand and silt. The parent material has weathered to a sandy to clay loam. No outcrops were observed, however, the ridge landforms indicate shallow residual and alluvial fan deposits over bedrock. In the lower and less steep areas of the burn, quaternary alluvium has been deposited to form thicker fan and fault basin sediments.

Q. Miles of Stream Channels by Order or Class: 1.25 miles of first order intermittent streams.

R. Transportation System

Trails: 1 miles Roads: 0.8 miles (level 2)

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 265 (low) 214 (moderate) 28 (high) (Figure 1)

B. Water-Repellent Soil (acres): 0

C. Soil Erosion Hazard Rating (acres): 332 (low) 215 (moderate) 0 (high)

D. Erosion Potential: 7.8 tons/acre (WEPP erosion rate over 24 month time period)

E. Sediment Potential: 461 cubic yards / square mile (WEPP sediment leaving profile over 12 month time period)

PART IV - HYDROLOGIC DESIGN FACTORS

A. **Estimated Vegetative Recovery Period**, (years): 8

B. **Design Chance of Success**, (percent): 90

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): 40

G. **Estimated Reduction in Infiltration**, (percent): 8

H. **Adjusted Design Flow**, (cfs per square mile): 43.2

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

Noxious Weed Species: Musk thistle (Carduus nutans)
Musk thistle is established in the drainage on the east side of the burn on private land. It is a very dense stand and occupies approximately 74 acres. The weed infestation continues in spots along the drainage to the northeast down drainage from the burn area. It is probable that Musk thistle was present in the burn area but can no longer be identified.

Musk thistle, also known as nodding thistle, is a native of southern Europe and Asia that invades pasture and forestlands, ditch banks, waste areas, and stream banks. Musk thistle is a biennial or sometimes a winter annual. Its dense growth and spiny nature inhibits the use of an area by people and animals. Tillage is not recommended for control because cut roots may resprout. Chemical and biological controls are effective on this aggressive plant. This weed is listed as a noxious weed by Nevada Administrative. Herbicide application or mechanical removal during the rosette stage can control this weed. Dispose of the seeds, shoots, and roots, all of which can grow a new plant, in a sealed garbage bag through the trash. To avoid wind dispersal of the downy seeds, dispose of seed head carefully.

The Grassy Springs Fire has resulted in disturbed, bare ground that is open to musk thistle invasion, especially in areas that burned at high intensity and lacked adequate vegetative cover prior to the fire. Fire suppression efforts, including line building, vehicle traffic on and off roads, and foot travel through infested areas to put out spot fires has likely spread thistle seed throughout portions of the burn especially adjacent to the mapped weed area. The fire crews walked a grid through the Musk thistle to mop up active burn spots.

This burn will need monitoring for musk thistle invasion and possible treatment for up to three years. Seeding of the low to high intensity burn areas adjacent to the weed area may help create a competitive advantage for native plants over musk thistle.

Cheatgrass (Bromus tectorum) is an invasive weed species in Nevada. It is an annual that germinates at a cooler temperature than other native plants. This gives it an advantage to establish in burn areas before native plants have a chance to germinate. It thrives with fire. Approximately 10 acres have been mapped in and around the burn area. Patches are predominately located on the south and east sides of the burn. Minor amounts were seen within the burn in the western part on a ridgeline. It is not expected to dominate the post-burn vegetation, however, if Musk thistle spreads, it could increase the chances of cheatgrass invasion.

Off-road travel in the burn area and livestock grazing could accelerate the spread of musk thistle and reduce biodiversity.

B. Emergency Treatment Objectives:

Treating Musk thistle on private land with an herbicide:
The large area of Musk thistle is located on private land. The NRCS has not been available to discuss this situation and the need for treatment. The objective is to first work through NRCS and the land owner to have the area treated. If no action results, the Forest Service needs to treat the area so the federal lands are not infestated and loss to soil productivity and biodiversity.

Seeding of Burned Area (Private and National Forest):
The objective is to establish native, perennial vegetative cover in the low to high burn severity areas adjacent to the Musk thistle infested area on private and National Forest lands to provide competition against and control the spread of Musk thistle, a noxious weed.

Signing perimeter for OHV travel restrictions and temperarily issuing an emergency closure order prohibit OHV travel in the burn area:
The objective is to restrict OHV travel in the burn area to mitigate the spread of Musk thistle, reduce soil erosion, and increase the vegetation success.

Grazing of Livestock in Burned Area:
The objective is to temporarily restrict livestock grazing within the burn area beginning Sept. 1, 2005 and continuing until at least Sept. 1, 2007 to allow the burn area to revegetate, stabilize, and reduce the spread of Musk thistle. If monitoring indicates that noxious and invasive weeds, lack of vegetation recovery or soil erosion are concerns, extend the timeline to reintroduce live stock grazing by one year or until it has been determined that burn rehabilitation objectives have been met and that grazing would not reverse recovery.

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

Land **80** % Channel **NA** % Roads **NA** % Other **NA** %

D. Probability of Treatment Success

There is a 90% probability of success if the Musk thistle is sprayed and monitored and the seeding adjacent to the infested area establishes and competes against the spread of Musk thistle.

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

Using the value of soil as a basic resource, the loss for the first three years after the fire is valued at $312,000. This figure is based on the difference between the pre-fire soil erosion rate of 0.1 tons/acre/year and post-fire soil erosion rate of 4.3 tons/acre/year with a soil value at $50/ton. In addition to the loss of soil productivity, over time, Musk thistle invasion may lead to a type conversion without the addition of a native plant biomass and better soil surface stabilization. This could increase the chance that the existing cheatgrass patches outside and inside the burn area could spread at an increased density.

The cost of not conducting the noxious weed monitoring, treatments, and seeding is calculated as follows: Estimated cost to hand spray with herbicide is about $168 per acre and can increase in steep terrain. Add to this an exponentially greater cost if musk thistle spreads beyond the burn area into the surrounding unburned areas. If this noxious weed is allowed to spread throughout the fire, it may cost an average of $85,000 per year to treat for 2 years for a total of $170,000. A minimal of two years would be required for treatment followed by restoration activities. This does not include costs associated with the loss of livestock grazing, mule deer and elk habitat and the native plant biodiversity.

Total cost of no-action is estimated at $482,000.

F. Cost of Selected Alternative (Including Loss):

Seeding in specified areas will reduce soil erosion, the invasion of Musk thistle and minimize the probability for a vegetation type conversion. Soil productivity will be increased with the addition of a native plant biomass and result in better soil surface stabilization. Increased soil stabilization should reduce erosion and depositional effects down drainage on the private land. By maintaining a diverse plant community and structure, Musk thistle invasion should be kept to a minimum. A 27% reduction in soil loss by seeding could be a savings of $33,000. If 90% of the Musk thistle treated is killed, this could save $153,000. This totals $186,000.

Total cost of selected alternative including loss is $50,000 (cost of alternative) + ($482,000 (no-action cost) - $186,000 (alternative treatment savings)) = $346,000.

G. Skills Represented on Burned-Area Survey Team:

[**X**] Hydrology	[**X**] Soils	[**X**] Geology	[ ] Range
[ ] Forestry	[ ] Wildlife	[ ] Fire Mgmt.	[**X**] Engineering
[ ] Contracting	[**X**] Ecology	[**X**] Botany	[ ] Archaeology
[ ] Fisheries	[ ] Research	[ ] Landscape Arch	[**X**] GIS

Team Leader: Loretta Cartner

Email: lcartner@fs.fed.us Phone: 775-289-5120 FAX: 775-289-2132

H. Treatment Narrative:

Treating Musk thistle with herbicide:
Herbicide treatment will be coordinated with NRCS utilizing the Wyden authority. The NRCS will work with the landowner to accomplish treatment. Herbicide would be applied late spring to early summer on approximately 74 acres. If NRCS and the landowner are not able to accomplish this, the Forest Service will work with the landowner to assure that the weeds are treated and the Forest Service burned lands are minimally invaded by the noxious weed. Weed treatment would follow best management practices for herbicide application.

Seeding of Burned Area:
Seed will be applied to the areas of the fire that have a low to high burn severity adjacent to the Musk thistle area (Figure 2). The high severity burn occurred on steep slopes with a NW exposure (Figure 1) and within 400-1000 feet away from the thistle infested area. Reestablishment of grass and associated root biomass will compete against thistle invasion and reduce anticipated erosion and associated soil loss and off-site sediment movement. The majority of low to moderate burn severity areas will not be seeded due to the greater distance from the thistle area and the likelihood of pre-burn grasses resprouting.

Broadcast seeding will be completed on 70 acres of NFS lands in the fall or early winter of 2005. An additional 127 acres is recommended for seeding on the private lands. Application rate will be 14 pounds per acre of noxious weed free, pure live native grass seed of the following species, in the following amounts:

* 2 lbs/ac Sandberg bluegrass (Poa secunda)
* 4 lbs/ac Bluebunch wheatgrass (Psuedoroegneria spicata)
* 4 lbs/ac Indian ricegrass (Achnatherum hymenoides)
* 4 lbs/ac Slender wheatgrass (Elymus trachycaulis trachycaulis)

Seed application will be completed with District personnel and utilize an ATV with a broadcast seeder mounted on the front and a harrow blanket on the back to cover the seed. Broadcast seeding would be accomplished prior to winter weather and snow. The cost to purchase an ATV broadcast seeder is more cost effective than contracting the equipment with an operator. It saves cost in contract administration and also allows district personnel to monitor the ground conditions and apply the seed at the most appropriate ground conditions.

Seeding cost is estimated below:
ATV – $16/acre X 70 acres = $1,120
Seed - $120/acre X 70 acres = $8,400
ATV broadcast seeder - $500
Total seeding cost = $10,020

Signs:
Eight (8) area closure signs should be posted at road junctions around the burn area. The signs are estimated to cost $70 to purchase and install. A temporary closure order to off-road vehicle travel will be processed will be posted on the ground as required.

Other Non-emergency Recommendations:

Highway Culvert:
Due to the small size of the fire and relatively flat slopes, most treatments would not have a significant effect on current soil loss rates. The small watershed above the highway on the southwest side does provide a slight risk to the culvert and highway. While hydromulching above the highway would mitigate most of the runoff that may occur, the costs may not be justified. In addition, it is in NDOT's right-of-way where they have maintenance responsibility. The Forest Service will need to inform NDOT of a possible maintenance need and to monitor the culvert that runs under the highway at that location, especially after heavy precipitation and runoff events.

Water Diversion Ditch:
NRCS should be advised to work with the landowner to consider installing straw bale structures or check dams in the downcut water diversion ditch on the east side of the burn. Another option is to breach the ditch to allow water to flow out of the ditch in multiple locations. This treatment would reduce the likelihood of the ditch downcutting further and potentially delivering excessive sediment at the terminus of the ditch.

Erosion in Ephemeral Drainages:
As a result of the amount of fuels that were burned near the ground and the change in soil structure in many of the burned areas, there is potential for increased surface erosion, especially during extreme meteorological events. Rehabilitation projects should be implemented as soon as possible, preferably during the fall of 2005. Straw bail barriers should be placed in several places in the two small ephemeral drainages to attenuate increased stream flow and sediment-carrying events. The most strategic places would be near the terminus of the drainage near the National Forest boundary, near the confluence of the 2 drainages, and then three above the confluence in the west trending drainage and three above the confluence in the southwest trending drainage. They should be constructed perpendicular to and across the channel drainage and should be positioned in a shallow trench with the top of the end bales 8-12 inches higher than the top of the center spillway bails. Wooden stakes or rebar will be used to anchor each bail in place. The straw must be certified "weed free" to prevent the introduction of weeds to the site. If the bails do not last long because of cattle or elk impacts, mitigation efforts can be taken. Other feasible options may also be implemented if monitoring shows them to be ineffective or just do not last long enough. Monitoring should consist of site visits with observations and photographs at least once a year for 2 to 4 years after implementation. The barriers are not being recommended at this time for approval. Monitoring will determine the need for the barriers.

I. Monitoring Narrative:

Monitoring Needs:
Monitoring is needed for seeding success, establishment of noxious and invasive weeds, excessive erosion of roads, slopes and drainages, unauthorized livestock use, and excessive sediment impairing the function the ecosystem. If monitoring shows the need for additional treatments, future requests for funding may be submitted.

Treatments to be Monitored, How, and When: Monitor for 3 years using three resource specialists. Monitoring will include photo documentation and data collection. Monitoring will take place in August or September of 2006. The following areas willl be monitored.

Seeding success across the entire burn area – Establish four transects where occurrence and cover of plant species and ground cover are recorded along transect lines within the burn area. Utilize this data to determine seeding success, regeneration success and presence of noxious and invasive

species. Read these transects each year for three years, beginning in 2006. Determine if future vegetation treatments will be needed.

Roads and fire line – Visually monitor to make sure erosion isn't excessive.

Intermittent drainages - Visually monitor changes in the drainages using the proper functioning condition approach. Impacts from sediment and scour would be recorded.

Erosion - Visually monitor for sheet erosion, rills, and gullies. Use data to verify erosion models and calculate how much sediment has eroded from the burn area. Determine a need for future treatments.

Private Land – Coordinate with the landowner and NRCS to visually monitor private land for impacts from fire (sediment, scour, impacts to PFC, weeds, downcutting in diversion ditch).

Livestock and Wildlife – Visually monitor for livestock and wildlife use in the burn area, document any impacts and discuss needs for adjustment to the grazing permit.

ATV Use - Visually monitor for off-road vehicle use and impacts.

Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

			NFS Lands				Private Lands			All
		Unit	# of	WFSU	Other	# of	Fed (Wyden)	# of	Non Fed	Total
Line Items	Units	Cost	Units	SULT $	$	units	$	Units	$	$
A. Land Treatment										
broadcast seeding	acre	$16	70	$1,120		127	$2,032			$3,152
seed	acre	$120	70	$8,400		127	$15,240			$23,640
herbicide spraying	acre	$168				74	$12,432			$12,432
broadcast seeder	each	$500	1	$500						$500
Subtotal Land Treatment				$10,020			$29,704			$39,724
B. Channel Treat.										
C. Road and Trails										
D. Structures										
signs	each	$70	8	$560						$560
Subtotal Structures				$560						$560
E. BAER Evaluation										
GIS Technician	day	$150	2	$300						$300
Team of 3 specialists	day	$300	18	$5,400						$5,400
Team per diem	day	$90	9	$810						$810
Subtotal Evaluation				$6,510						$6,510
F. Monitoring										
Team of 3 specialists	day	$300	9	$2,700						$2,700
Team per diem	day	$90	6	$540						$540
Subtotal Monitoring				$3,240						$3,240
G. Totals				$20,330			$29,704			$50,034

Bibliography:

DeBano, Leonard F., Daniel G. Neary, and Peter F. Folliot, 1998. Fire's Effects on Ecosystems. John Wiley & Sons, Inc. 333 pages.

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Nevada Bureau of Mines and Geology, Mackay School of Mines, University of Nevada, Reno. 1977. Geology and Mineral Deposits of Lander County, Nevada, Bulletin 88.

USDA Natural Resource Conservation Service. 2002. *Plants National Database*. http://plants.usda.gov/

WEPP Internet Interface Disturbance Model (Water Erosion Prediction Project) – USDA-Agricultural Research Service National Soil Erosion Research Laboratory.

WEPP internet link. University of Idaho, Moscow, Idaho. http://forest.moscowfsl.

PART VII - APPROVALS

1. /s/Kathy Nicholas for EDWARD C. MONNING — Sept. 13, 2005
   Acting Forest Supervisor (signature) — Date

2. _____ _____
   Regional Forester (signature) — Date

Figure 1

Grass Springs Fire, Burn Intensity

Austin Ranger District, Humboldt-Toiyabe NF

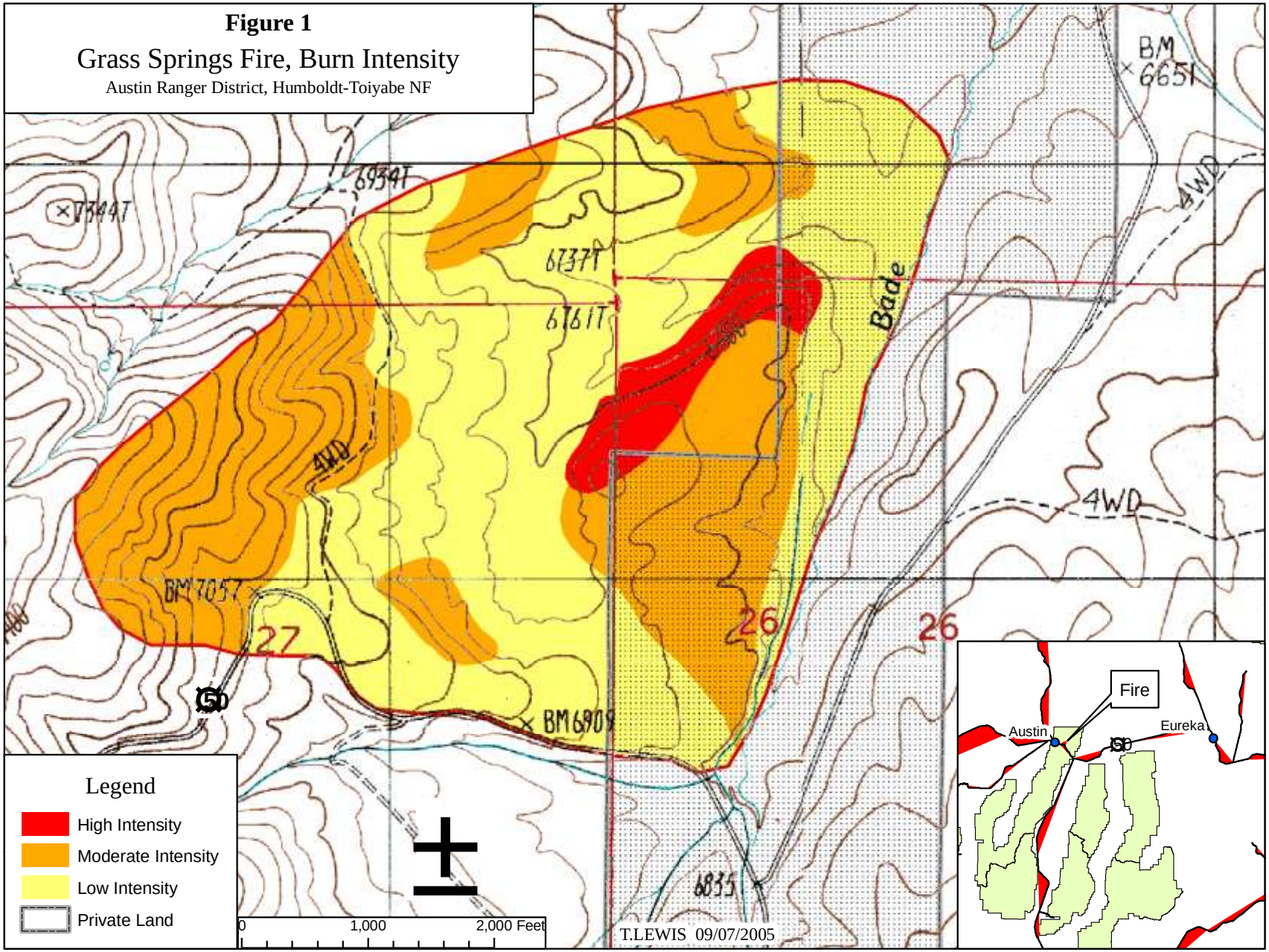

Figure 2

Grass Springs Fire, Weed Areas

Austin Ranger District, Humboldt-Toiyabe NF

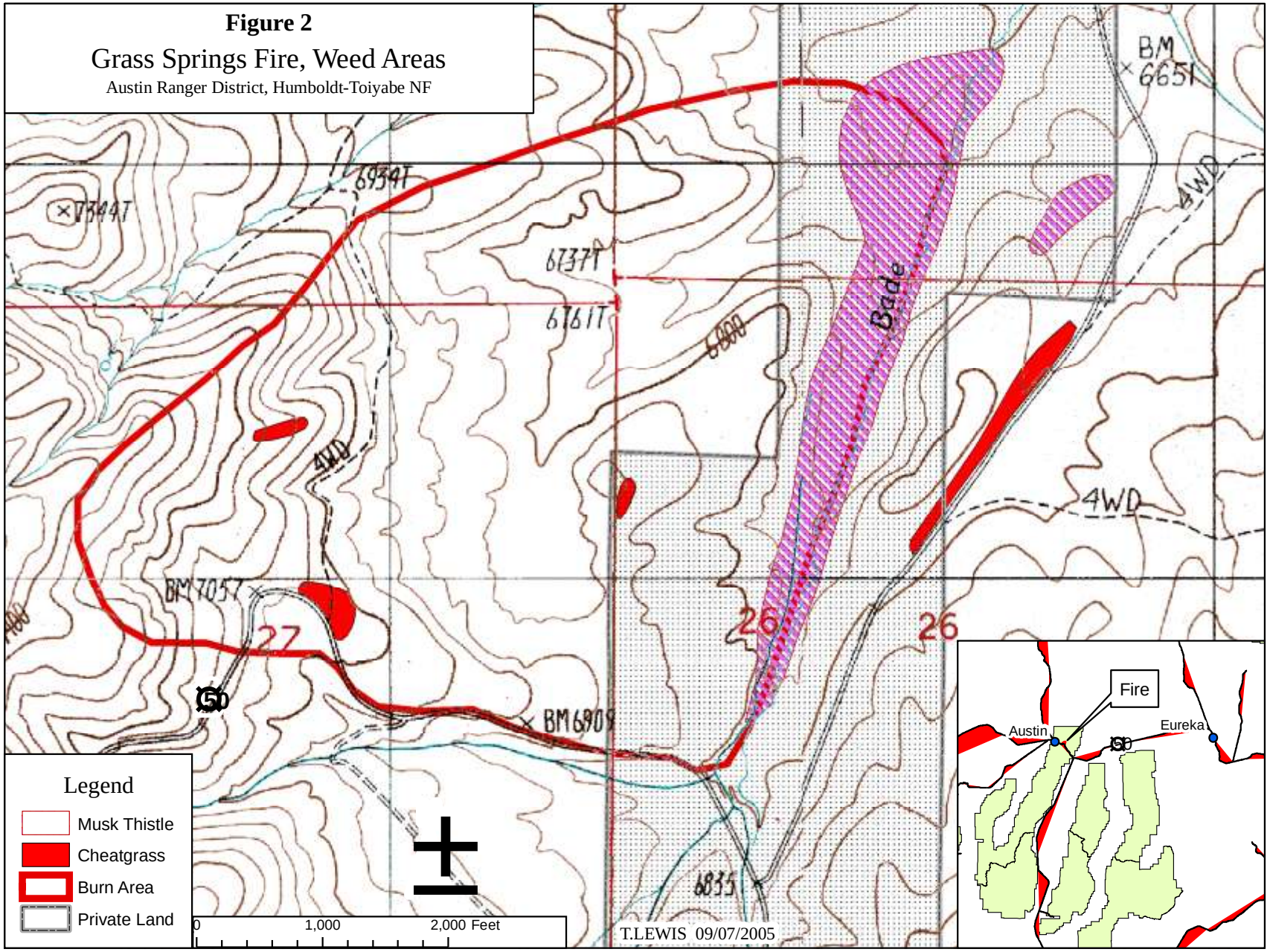

Figure 3

Grass Springs Fire, Proposed Seeding

Austin Ranger District, Humboldt-Toiyabe NF