



M. Watershed Numbers: 160300050508 / Sunset Canyon and 160300050509 / Walker Creek – 6th Field HUCs )

N. Total Acres Burned: 1,097

( Summary of Acres Burned by Land Ownership )

1,097	<b>NFS Lands</b>	-0-	<b>Other Federal</b>	-0-	<b>State of Utah</b>	-0-	<b>Private</b>
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O. Vegetation Types: Mixed conifer sites consisting of white fir, douglas fir, subalpine fir and a few scattered aspen had occurred on the northwest facing slopes of very steep mountainsides at elevations above 6,850 feet ( 8 % ); curleaf mountain-mahogany was observed on mountain summits and along ridgetop areas; it was also intermixed throughout the burn on shallow soils and very stony sites ( 11 % ); most of the area on the rolling benches had supported gambel oak with scattered conifers, rocky mountain juniper, mountain big sagebrush and perennial grasses ( 69 % ); a few small meadows with mountain big sagebrush were mapped on the western edge of the burn ( 10 % ) and the remaining upland areas were in PJ with grasses ( 2 % ).

P. Dominant Soils: Most of the mixed conifer sites have Mollic Haplocryalfs, Typic Haplocryalfs and Lithic Haplocryalfs as their primary soil types; the areas supporting curleaf mountain-mahogany were mapped as Lithic Haplustolls and Lithic Argiustolls; the gambel oak sites located on the rolling bench were identified as Pachic Argiustolls, Pachic Haplustolls and Typic Argiustolls; the mountain big sagebrush meadows were documented as Typic Haplustolls and the remaining PJ dominated lands were mapped as Aridic Argiustolls and Aridic Haplustolls.

Q. Geologic Types: Most of the burned-area had wildland soils formed in colluvium and residuum from the noncalcareous, Nugget Sandstone Formation; a few small areas on the east side of the disturbance had soils derived from hard Tintic Quartzite deposits; the term quartzite is commonly used to label metamorphosed sandstone rocks.

R. Miles of Stream Channels by Order or Class:

Stream Names	Zero Order	1st Order	2nd Order	3rd Order
Smith Hollow	-0-	0.5	0.3	-0-

S. Existing Transportation Systems ( 2 )

Trails: Several unauthorized trail segments for OHV use occur on the rolling benchlands; 1/4 mile of aqueduct exists to support a water delivery system

Roads: ~ a 1/2 mile of improved dirt road surface leads-up the bench to a developed spring site for the community of Meadow, Utah; another 1/4 mile of road occurs next to Walker Creek and leads-up to another spring site developed and used by the town.

### PART III - WATERSHED CONDITION

A. Burn Severity ... based on low-level flights, Landsat imagery & on-the-ground field sampling ( # of acres )

332	<b>Low</b>	480	<b>Moderate</b>	285	<b>High</b>
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B. Estimate of Water-Repellent Soils ( acres ): 657 ( ~ 60 % of the entire burned-area )

C. Soil Erosion Hazard Rating ( # of acres )

428	<b>Low</b>	430	<b>Moderate</b>	239	<b>High</b>
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D. Erosion Potential: 21.3 tons / acre

E. Sediment Potential: 2,314 cubic yards / square mile

#### **PART IV - HYDROLOGIC DESIGN FACTORS**

A. Estimated Vegetative Recovery Period	7 years
B. Design Chance of Success	65 %
C. Equivalent Design Recurrence Interval	2 years
D. Design Storm Duration	1 hour
E. Design Storm Magnitude	0.61 inches
F. Design Flow	11.7 cfs / mi <sup>2</sup>
G. Estimated Reduction in Infiltration	17 %
H. Adjusted Design Flow	65.0 cfs / mi <sup>2</sup>

#### **PART V - SUMMARY OF THE ANALYSIS**

##### A. Describe Critical Values-at-Risk / Resources and Immediate Threats

**Threats to Human Life and Property** ... On 08-01-2006, Meadow and the surrounding mountains experienced a 5 to 10 - Year / Storm Event during the mid-afternoon hours. Initially, a large flush of water entered upper Sunset Canyon from the SE part of the burned-area. It caused a small amount of damage to the existing roadway. Very little if any, flood water actually approached the town in Walker Creek. Most of the resource damage occurred in Smith Hollow as water, mud and assorted debris were flushed away from the SW part of the burn. This material washed for a mile or two down the channel towards the irrigated croplands located in the SE part of town. The water was intercepted by a concrete ditch which acted as a physical barrier protecting the community and its agricultural lands. The greatest threat to human life is people visiting the burn area.

- ➔ **The Potential Loss of Long-Term Soil Productivity** ... Approximately 70 % of this wildfire had moderate to high severity burns on steeply sloping benches and steep to very steep mountainsides. Hydrophobic ground conditions exist within approximately 60 % of the burned-area. There is a concern about the type of plants that would become re-established within the loss of soil.
- ➔ **Potential for the Establishment of Noxious Weeds and Invasive Plant Species** ... Several different species of invasive and noxious plants occur in close proximity to this burn. These plants are squarrose knapweed, Scotch thistle and whitetop. In addition, there is a significant amount of cheatgrass already established on the neighboring BLM Lands to the west.
- ➔ **Stabilization of Road Surfaces leading-up into Developed Spring Sites** ... There are several developed spring sites occurring within and in very close proximity to the burned-area. All of these developed sites are part of a collective water system for the water supply for the community of Meadow, Utah. Currently, the existing road going into Sunset Canyon and the spring sites is susceptible to damage by potential overland flows and runoff. This road is needed for access to the water system spring sites. The road will require several drainage dips and a partial re-alignment in order to stabilize the transportation surface for safe travel. The unimproved dirt road coming up the fan terrace into Section 31 needs some work to correct a loss of water control – which is causing erosion to the surrounding uplands.

##### B. Emergency Treatment Objectives:

Our recommended land treatments include weed monitoring and herbicide applications on noxious weed sites and broadcast seeding of native and introduced grasses. The objective is to prevent the establishment of

invasive and noxious plants within the burned-area. The purpose of our broadcast seeding is two-fold. To a certain extent, we're going to combine the seeding with the other weed treatments as another means of limiting the growth of weeds and cheatgrass in the burned-area. And, the various seedings will be intended to prevent a loss of long-term soil productivity by stabilizing erosive ground conditions on fire-damaged terrain.

All of our road treatments are intended to stabilize existing transportation surfaces for 1) public safety reasons, 2) limiting erosive conditions to surrounding uplands, 3) limiting damage to our capital investments and 4) keeping roadways open to access water sources used by the local officials and town residents.

Gates and signs will be used in an effort to protect the burned-area from curious people and to explain the hazards that are directly associated with the fire incident to local residents.

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We did not request funds for treatments that were unnecessary according to the current policy of BAER. The Fishlake NF / BAER Team had no hidden agendas related to livestock, wildlife, on-going District programs, requests made by local units of government or special interest groups. We simply got together, made the assessment and recommended treatments in the spirit of BAER that were thought to be reasonable and prudent in Year # 1 in order to stabilize ground conditions occurring within the burn and water flows associated with the fire.

C. Probability of Completing Emergency Stabilization Treatments Prior to Storm Damaging Event:

Land 80 % Channel N/A % Roads / Trails 85 % Protection / Safety 90 %

D. Probability of Treatment Success:

Treatment Types:	← Years After Treatment →		
	1	3	5
Land Treatments	75 %	80 %	85 %
Channel Treatments	-	-	-
Road Treatments	80 %	90%	80 %
Protection / Safety Treatments	90 %	85 %	80 %

E. Cost of Taking No-Action ( Including Loss ) \$ 950,000 ( homes, croplands, soils, transportation surfaces )

F. Cost of the Selected Alternative ( Including Loss ) \$ 299,000

G. Skills Represented on the Initial / Burned-Area Emergency Response Team:

X	Hydrology ( 2 )	X	Soils	X	Geology	X	Range		BLM
	Forestry	X	Wildlife	X	Fire Mgt.	X	Engineering		NRCS
X	Contracting	X	Ecology	X	Botany		Archaeology	X	Helibase
	Fisheries		Research		Visuals	X	GIS Support	X	District Staff

Team Leader: Michael D. Smith / Soil Scientist

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H. Treatment Narratives:

( 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 )

( Please see our GIS display of recommended BAER Treatments at this time )

- ① **Land Treatments** – The Fillmore Ranger District will monitor 199 acres of pinyon - juniper / mountain big sagebrush dominated landscapes located along the western edge of the burned-area for the establishment of noxious weeds – especially, Scotch thistle; in addition, they will monitor various suppression-related ground disturbances such as safety zones, drop point areas, dozer lines and hand lines in an effort to limit the establishment and spread of these unwanted plants. In conjunction with the stated monitoring activities, the District will treat about 15 acres of noxious weeds with chemical herbicides in order to limit the growth of these undesired plants.

The broadcast seeding currently being planned for the rolling bench land areas are intended to 1) prevent the establishment of invasive and noxious plants and, 2) stabilize erosive ground conditions on fire damaged terrain. The broadcast seeding includes 537 acres using a fixed-wing aircraft. Most of the target terrain is in the range of 8 to 25 % slopes. Our seed mix was designed for mid-elevation landscapes receiving precipitation in the range of 20 to 24 inches / year. A second seeding treatment using the same seed mix is being proposed on another 64 acres of bench lands using a Type III / Helicopter to accomplish the task; this fire-damaged area is located just north of Sunset Canyon on 25 to 40 % slopes; it was decided to use a helicopter to implement the treatment in this part of the fire for SAFETY PURPOSES.

A final seeding treatment using a high elevation mix for terrain receiving precipitation in the amount of 24 to 28 inches / year would be applied to 125 acres of steep mountainsides using a Type III / Helicopter to distribute the mix. This treatment is intended to protect and maintain long-term soil productivity on severely burned terrain.

Native or Introduced	Species to be Seeded	Seed Mix # 1 ( 20 – 24 / MAP .)	Seed Mix # 2 ( 24 – 28 / MAP )	Est. Costs / Pound ( PLS )
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**Pounds / Acre ( PLS )**

N	Big bluegrass “ Sherman ”	0.5	0.5	\$4.50
N	Mountain brome “ Bromar ”	4	5	1.20
N	Sandberg bluegrass VNS	0.5		4.00
N	Slender wheatgrass “ Pryor ”	3		2.00
N	Slender wheatgrass “ San Luis ”		3	2.00
N	Thickspike wheatgrass “ Bannock ”	0.5	0.5	5.50
I	Crested wheatgrass “ Hycrest ”	2		1.00
I	Orchardgrass “ Paiute ”	1		1.25
I	Orchardgrass “ Potomac ”		1	1.25
I	Timothy “ Climax, Mohawk, or Patomic ”		0.5	1.20
I	Alfalfa “ Ladak ”	1	1	1.60
I	Small burnet “ Delar ”	1		1.90

Total Pounds ( PLS ) / Acre	13.5	11.5
Total Seeds ( PLS ) / Ft <sup>2</sup> <sup>1/</sup>	64	63
Estimated Seed Cost / Acre	\$24.55	\$20.45
Estimated Cost Seed Mix / Pound	\$1.82	\$1.78

<sup>1/</sup> Recommended rates for broadcast seeding mixes are about 50 – 100 seeds per square foot when followed by dragging to cover the seed ( see Planting Guide for Utah ). The guide also states for aerial seeding, “ if it is not possible to cover seed, plant late in the fall and increase the seeding rate .”

**Specific ecological attributes valued for some of the recommended species include the following:**

Big bluegrass— “ noted for its early spring growth...used successfully for reseeding burned-over forest lands. ”

Mountain brome grass — “ quick cover... recommended sites include openings... and timber burns ”

Sandberg bluegrass — “ important for soil stabilization and forage for wildlife... one of the first grasses to green-up in the spring...excellent in low rainfall native mixes ”  
( This bluegrass should be very competitive with cheatgrass .)

Slender wheatgrass — “ valuable in erosion control because of its rapid development ”

Thickspike wheatgrass — “ adapted to disturbed range sites and dry areas subject to erosion ”

Crested wheatgrass — Hycrest is “ a hybrid between standard and introduced...outstanding seed producer, excellent seedling vigor, easy to establish under harsh conditions ”

Orchardgrass — “ adapted to pinyon-juniper and mountain brush... greens up early in the spring ”

Timothy — “ used as a ground cover...to control erosion on cut-over or burned-over timberland ”

Alfalfa — a legume that fixes nitrogen in the soil

Small burnet — “ non-leguminous...perennial winter-active forb...can grow on low fertility soils ”

**2** Channel Treatments - None

**3** Road Treatments – Re-condition a ¾ mile segment of existing road leading-up into a developed spring site located on the rolling bench about ¼ mile south of Walker Creek in Section # 31. The recent fire has already started to compromise the performance of the road surface; in some areas there is a distinct LOSS OF WATER CONTROL as the transportation surface is ( first ) collecting and subsequently flushing large volumes of water back upon the burned-area causing erosive ground conditions. The road is to be bladed and outsloped using a D-6 / Cat. In the event runoff from the fire causes problems with the spring site, one of several water sources for the community of Meadow, UT, the road access is needed for any repairs to the spring site.

Secondly, another small segment of road located in Sunset Canyon needs to be stabilized before runoff from the fire can 1) overtop its surface or 2) undercut its substratum layers – both situations resulting in a partial to total failure of the road surface. A potentially hazardous condition for vehicles and a contributor of non-point pollution in Sunset Canyon. Approximately, 150 feet of the existing road should be re-aligned to protect the transportation surface from very erosive conditions. This road is needed to access the PRIMARY WATER SUPPLY for the community of Meadow, UT which is located another ¼ mile up the canyon to the east. The entire job is expected to take about 1 to 2 days to complete. Due to the obvious signs of Native American history in the area ( petroglyphs ) ... a cultural survey needs to be completed in lower Sunset Canyon before beginning the recommended road stabilization project.

- ④ Protection and Safety Treatments –This burn requires several explanatory signs to alert the local residents about the potential hazards associated with the recent disturbance. These signs would be located in lower Sunset Canyon next to the temporary road closure gate at the Forest boundary ( sign # 1 ), two go in upper Sunset Canyon - one at the hunter's picnic site / parking area and another one just east of the spring site where the road turns into a trail ( signs # 2 & 3 ), one about ¼ mile west of the developed spring site in Section 31 along the perimeter of the burn ( sign # 4 ) and the final two go < ¼ mile south of Walker Creek in Section 25 on the 2WD access road leading-up into the northern part of the burn. ( signs # 5 & 6 ).

A road closure gate is being recommended for lower Sunset Canyon. This gate will be managed by the Fillmore Ranger District; it will be closed during inclement weather to protect local residents from potential flooding hazards – and, during the late winter / early spring seasons to keep motorized traffic off the Sunset Canyon Road. If accelerated rates of erosion cause the Sunset Canyon Road to become overtopped with mud – or, undercut and eroded from high stream flows ... the gate would close the canyon to all vehicular traffic until the situation was corrected.

Finally, the picnic table located at the hunter's picnic site needs to be removed from this dispersed camping / parking area for reasons related to public safety. Currently, the table sits in a hollow located at the southern edge of the burned-area. This site received a large flush of water and mud when a 5-Year Storm Event impacted the area after the fire.

#### I. Monitoring Narrative:

( Briefly 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)

( Projected Cost in Year # 1 - \$ 5,850 )

Both the implementation and effectiveness of our approved BAER treatments need to be monitored during the first year. The placement of our explanatory signs and the temporary gate, as well as their overall effectiveness, will be monitored with a trip to the field; the various locations and condition of the signs will be described and documented with digital photographs. This will occur once the signs and gate are in place - sometime in the late summer of 2006.

Vegetative monitoring will be done by walking transects through the different treatment areas ... sometime in the spring of 2007. The species present will be noted and compared to the seeded species list. Plant samples will be collected to provide an ocular estimate of cover by species type. In addition, the monitoring data for our seeding will include noting what seeded species performed best, what seeded species that did not do well and whether-or-not the seeded species out-competed the Scotch Thistle, cheatgrass and other invasive plant species. The general appearance of the vegetative response occurring in the burned-area will be described and photographed; this action includes the post-fire response of the pre-burn vegetation too.

Post-storm monitoring will also take place by analyzing the movement of water flowing off the Mountain, through the channels, across the roads and into the valley below. Two major storm events will be monitored within the first year. Data collected by a tipping rain bucket will be used in this analysis. Hydrophobic ground conditions will be checked while we're in the burned-area. The minor road re-conditioning and road stabilization treatments will be monitored to check their effectiveness as well with a visit or two to the field.

*Michael D. Smith*

**Part VI – Emergency Stabilization Treatments and Source of Funds - Initial BAER Report**

Line Items	Units	Cost	Units	BAER \$	\$	units	\$	Units	\$	\$
<b>A. Land Treatments</b>										
Weed Monitoring	acre	4	199	\$796	\$0		\$0		\$0	\$796
Herbicide Application	acre	80	15	\$1,200	\$0		\$0		\$0	\$1,200
Broadcast Seeding - F	acre	39	537	\$20,943	\$0		\$0		\$0	\$20,943
Broadcast Seeding - H	acre	67	64	\$4,288	\$0		\$0		\$0	\$4,288
Broadcast Seeding - H	acre	64	125	\$8,000	\$0		\$0		\$0	\$8,000
Temporary Seed Storage	month	100	3	\$300						\$300
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Land Treatments</b>				\$35,527	\$0		\$0		\$0	\$35,527
<b>B. Channel Treatments</b>										
				\$0	\$0		\$0		\$0	\$0
N/A				\$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 Channel Treat.</b>				\$0	\$0		\$0		\$0	\$0
<b>C. Road / Trails</b>										
Re-Condition Road to	mile	1500	0.75	\$1,125	\$0		\$0		\$0	\$1,125
Road Stabilization in S	job	3500	1	\$3,500	\$0		\$0		\$0	\$3,500
Survey of Cultural Res	day	335	3	\$1,005	\$0		\$0		\$0	\$1,005
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Road &amp; Trails</b>				\$5,630	\$0		\$0		\$0	\$5,630
<b>D. Protection / Safety</b>										
Explanatory Signs	sign	400	6	\$2,400	\$0		\$0		\$0	\$2,400
Road Closure Gate and	gate	1800	1	\$1,800	\$0		\$0		\$0	\$1,800
Close Dispersed Camp	job	250	2	\$500	\$0		\$0		\$0	\$500
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Structures</b>				\$4,700	\$0		\$0		\$0	\$4,700
<b>E. BAER Evaluation</b>										
BAER Team	job	14950	1	\$14,950	\$0		\$0		\$0	\$14,950
Helicopter - Bell 206 / L	hour	700	3	\$0	\$2,100		\$0		\$0	\$2,100
Supplies & Document	misc	550	1	\$0	\$550		\$0		\$0	\$550
				\$0	\$0		\$0		\$0	\$300
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Evaluation</b>				\$0	\$17,600		\$0		\$0	\$17,900
<b>F. Monitoring</b>										
Year 1	year	5850	1	\$5,850	\$0		\$0		\$0	\$5,850
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<b>Subtotal Monitoring</b>				\$5,850	\$0		\$0		\$0	\$5,850
<b>G. Totals</b>										
Previously approved				\$51,707	\$17,600		\$0		\$0	\$69,607
Total for this request				\$51,707						

**PART VII - APPROVALS**

1. /s/ Mary C. Erickson  
Forest Supervisor ( signature )

August 7, 2006  
Date

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

8/11/06  
Date