Date of Report: August 6, 2007

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report
- [X] 1. Funding request for estimated emergency stabilization funds
- [ ] 2. Accomplishment Report
- [ ] 3. No Treatment Recommendation

B. Type of Action
- [X] 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: Salt Creek

B. Fire Number: UT-SCS-00142

C. State: Utah

D. County: Started in Juab, also burned in Sanpete

E. Region: R4/Intermountain

F. Forest: Uinta and Manti-La Sal

G. District: Spanish Fork

H. Fire Incident Job Code: PNDR8D

I. Date Fire Started: July 19, 2007

J. Date Fire Contained: July 29, 2007

K. Suppression Cost: $4.2 million

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): ~ 6.5 miles (Uinta NF – 2 miles of dozer, 2 miles of handline; Manti-La Sal – 0.5 miles of dozer; 2 miles of handline)
2. Fireline seeded (miles): None at this time; 6.5 miles planned for seeding this fall.
3. Other (identify): ~36.5 miles of fire-line on Non-NFS lands was rehabilitated and is planned for seeding this fall.

M. Watershed Number: On NFS Lands = 160202010103 -Hop Creek, 160202010104 – Pole Creek-Salt Creek, 160202010105 – Footes Canyon-Salt Creek; Non-NFS land = 1603000040101 – Big Hollow and 160300040102 – Serviceberry Hollow

Sixth-Level HUC (watershed)	Total HUC Area* (acres)	Burn Severity at the Watershed Scale							
		Low		Moderate		High		Total Burned	
		Area (acres)	(% of HUC)	Area (acres)	(% of HUC)	Area (acres)	(% of HUC)	Area (acres)	(% of HUC)
160202010103-Hop Cr-Water Hollow	25,671	806	3%	6,927	27%	2,126	8%	9,859	38%
160202010104-Pole Canyon-Upr Salt Cr	24,679	307	1%	2,899	12%	1,906	8%	5,112	21%
160202010105-Footes Canyon-Lwr Salt Cr	11,527	303	3%	1,719	15%	738	6%	2,760	24%
160300040101-Big Hollow	13496	529	4%	226	2%	1	0%	756	6%
160300040102-Serviceberry Hollow	13,858	1,070	8%	2,390	17%	49	0%	3,509	25%
Totals =		3,015		14,161		4,820		21,996	

*Total HUC area includes the acreage outside of the burn perimeter; there is 2,663 acres of unburned within the fire perimeter

N. Total Acres Burned: Fire Perimeter Area = 24,659 acres (includes 2,663 acres of unburned)
[x] NFS Acres (9,598) [x] Other Federal (4,415 – BLM)
[x] State (377 – SITLA; 1,453 UDWR) [x] Private (8,816)

O. Vegetation Types:

Vegetation Type	Burn Severity by Land Status (H – High; M – Moderate; L – Low; and U – Unburned)															
	USFS (acres)				BLM (acres)				State: UDWR and SITLA (acres)				Private (acres)			
	H	M	L	U	H	M	L	U	H	M	L	U	H	M	L	U
Mountain Brush	2,781	4,414	359	217	291	1,277	120	99	157	225	11	31	989	2,702	251	464
Pinyon/Juniper	20	192	26	28	16	978	307	251	69	339	258	307	15	1,028	388	382
Grass/Sagebrush	142	749	119	47	19	594	345	108	20	51	212	136	135	1,134	520	369
Riparian	30	147	22	24	-	-	-	-	1	1	-	-	20	80	16	52
Agriculture	-	-	1	1	-	-	-	-	-	1	-	-	-	31	26	94
Aspen	40	13	9	13	9	1	-	-	7	-	-	-	44	18	5	15
Conifer	-	1	-	-	-	-	-	-	-	-	-	-	4	4	-	4
Grasses	7	108	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Urban	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Salt Desert Flat	-	-	-	-	-	-	-	-	-	-	-	-	-	7	2	1
Bare	3	65	16	17	-	-	-	-	-	-	-	1	-	4	2	8
Totals =	**3,023**	**5,686**	**551**	**339**	**336**	**2849**	**772**	**458**	**254**	**618**	**482**	**475**	**1,207**	**5,008**	**1,210**	**1,391**

P. Dominant Soils: Soils information is described in the Natural Resource Conservation Service (NRCS) following soil surveys: the Fairfield/Nephi Area Soil Survey (UT608) and the Sanpete Valley Soil Survey (UT627). The following two tables summarize the soil map units, textures, and subgroup taxonomy.

NRCS FAIRFIELD / NEPHI AREA SOIL SURVEY			
MAP UNIT SYMBOL	SOIL TEXTURE	SOIL SUBGROUP	Acres
AbF	Very stony Loam	Lithic Haploxerolls	49
BdD	Gravelly Loam	Typic Calcixerolls	8
BdF	Gravelly Loam	Typic Calcixerolls	929
CG		Cumulic Haploxerolls	327
FdF	Loam	Cryic Pachic Paleborolls	31
HaF	Loam	Argic Pachic Cryoborolls	1042
LdF	Very cobbly Loam	Lithic Calcixerolls	202
LeF	Very cobbly Loam	Lithic Calcixerolls	527

NRCS FAIRFIELD / NEPHI AREA SOIL SURVEY			
MAP UNIT SYMBOL	**SOIL TEXTURE**	**SOIL SUBGROUP**	**Acres**
MeD	Loam	Typic Argixerolls	307
MnF	Silt loam	Typic Paleboralfs	41
PD		Pachic Cryoborolls	1946
PeF	Very stony Loam	Argic Pachic Cryoborolls	490
RF			289
RnF	Very cobbly Loam		1621
RpD	Gravelly Clay loam	Xeric Torriorthents	219
RS			16
SeF	Very cobbly Loam	Lithic Xerollic Calciorthids	293
ShE	Very cobbly Loam	Calcic Argixerolls	1
ShF	Very cobbly Loam	Calcic Argixerolls	67
SpF	Very cobbly Loam	Lithic Cryoborolls	311
TF		Typic Haploborolls	1089
WcF	Very cobbly Loam	Lithic Argixerolls	720
XB		Xeric Torriorthents	844
YaC	Very stony Loam	Typic Argixerolls	435
YaD	Very stony Loam	Typic Argixerolls	380
YaE	Very stony Loam	Typic Argixerolls	1134
YbF	Very stony Loam	Typic Argixerolls	799

NRCS SANPETE VALLEY AREA SOIL SURVEY			
MAP UNIT SYMBOL	**SOIL TEXTURE**	**SOIL SUBGROUP**	**Acres**
AHD			431
AkC			672
ALD			547
AmC2			1212
ASE2			41
ATF			158
BCE			529
BDE			380
BFD			445
BnB	Very fine sandy loam	Cumulic Haploxerolls	218
BSE2			1122
DCD	Stony Silt loam	Typic Palexerolls	173
DED	Stony Silt loam	Typic Palexerolls	1163
DEE	Stony Silt loam	Typic Palexerolls	396
DFF			229
FOD			9
HED	Silt loam	Typic Palexerolls	80
LTE			299
MbC	Loam	Typic Argixerolls	1495
MrD			3
MSD	Clay loam	Typic Calcixerolls	11
ObC			30
OCD	Silty clay	Vertic Haploxerolls	65
PRF	Stony Fine sandy loam	Abruptic Cryic Paleborolls	17
RO			1
ToB			40
TT	Very stony Loam		285

NRCS SANPETE VALLEY AREA SOIL SURVEY			
MAP UNIT SYMBOL	**SOIL TEXTURE**	**SOIL SUBGROUP**	**Acres**
WEG			229
YHE	Stony Silt loam	Typic Argixerolls	257

Q. Geologic Types: Geology map units located within the fire area include the following: Ki-Indianola Group, undivided; Qal-Alluvium; Qf-Terrace deposits; QTcf-Coalesced alluvial-fan deposits; QTpm-Pediment mantle; T(Ja)-Intrusive masses of the Arapien Shale; Tc-Colton Formation; Tf-Flagstaff Limestone; Tg-Green River Formation; Ti-Intrusive igneous rocks; TKn-North Horn Foramation; and Tm-Moroni Formation

Geology Map Unit	Burn Severity Rating (acres)				
	High	**Low**	**Moderate**	**Unburned**	**Total**
Ki	2,034	308	3,224	410	**5,977**
Qal	21	225	607	238	**1,090**
Qf	4	17	58	4	**83**
QTcf	351	348	1,072	217	**1,988**
QTpm	96	19	205	9	**330**
T(Ja)	106	143	677	165	**1,091**
Tc	35	24	192	117	**368**
Tf	186	94	958	10	**1,247**
Tg	1	100	27	206	**334**
Ti	4	-	6	-	**10**
TKn	137	3	56	6	**202**
Tm	1,847	1,735	7,081	1,273	**11,938**
Total =	**4,822**	**3,016**	**14,164**	**2,655**	**24,659**

R. Miles of Stream Channels by Order or Class: 16.9 miles of perennial streams
128.3 miles of intermittent streams

S. Transportation System: **Trails:** 2.2 miles - Manti-La Sal NF
Roads: 5.8 miles – BLM; 31.0 miles – Private, County, and UDOT Roads ; 1.2 miles - SITLA; 3.0 miles – UDWR; 11.6 miles – USFS (Total = 52.6 miles)

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Ownership-Management	Burn Severity (acres)				
	High	**Moderate**	**Low**	**Unburned/Very Low**	**Total**
BLM	336	2,849	772	458	4,415
Private	1,207	5,007	1,211	1,391	8,816
SITLA	31	28	272	46	377
UDWR	223	590	210	429	1,453
USFS	3,022	5,686	551	339	9,598
Total =	4,820	14,161	3,016	2,663	24,659

B. Water-Repellent Soil (acres):

Land Status	Water Repellent Soils (acres)
BLM	130
Private	375
SITLA	9
UDWR	41
USFS	967
Total =	**1,522**

C. Soil Erosion Hazard Rating (acres):

Land Status	Soil Erosion Hazard Rating (acres)				
	Very Severe	Severe	Moderate	Slight	Not Rated
BLM	0	91	1,076	77	3,171
Private	52	1,118	3,061	1,223	3,363
SITLA	0	1	0	1	376
UDWR	35	493	222	80	617
USFS	22	5,500	1,155	2,399	523
Totals =	**109**	**7,203**	**5,514**	**3,780**	**8,050**

D. Erosion Potential: 14 tons/acre

E. Sediment Potential: 6,580 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): Five to ten years. The Forest Service is not recommending seeding. Oakbrush, many other mountain shrub species, and the dominant perennial grasses on NFS lands will begin to emerge this year. It is likely that Forest Plan standards for vegetative litter will be achieved within three years. In pinyon-juniper dominated sites, exposed rock will play a role in reduction of soil loss.

B. Design Chance of Success, (percent): 80%

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

D. Design Storm Duration, (hours): 0.5-hr

E. Design Storm Magnitude, (inches): 0.78 inches

F. Design Flow, (cubic feet / second/ square mile): Average Pre Fire = 73 csm
Note: The design storm is a very localized (less than 4 mi^2) high intensity short duration storm. The csm estimates should not be applied to watershed larger than 5 mi^2.

Pre- & post-fire modeling results for selected watersheds for the 10-yr, ½-hr storm (0.78 inch).

Watershed	Area (mi^2)	Pre-Fire Modeling Results				Post-Fire Modeling Results			
		Total Runoff (acre-ft)	Peak Time (hours)	Peak Flow (cfs)	Peak Flow (csm)	Total Runoff (acre-ft)	Peak Time (hours)	Peak Flow (cfs)	Peak Flow (csm)
Rolley Canyon	1.2	6	0.76	107	93	29.9	0.67	522	454
Serviceberry Hollow	4.0	10.4	1.01	147	37	32.9	0.9	458	115
Water Hollow Tributary #1	0.7	2.9	0.59	82	118	9.6	0.45	270	389
Water Hollow Tributary #2	1.8	6.9	0.73	153	85	20.7	0.67	440	244
Rocky Ridge Creek	1.2	1.3	0.64	35	30	5.12	0.54	132	114

G. Estimated Reduction in Infiltration, (percent): 72%

Pre- and post-burn runoff volumes for the design storm (10-yr, 0.5-hr = 0.78 inches)

Watershed	Watershed Area (acres)	Percent Burned	Pre Fire Volume (acre-ft)	Post Fire Volume (acre-ft)	Infiltration Reduction
Rolley Canyon	736	88%	6	29.9	80%
Serviceberry Hollow	2,553	55%	10.4	32.9	68%
Water Hollow Tributary #1	444	76%	2.9	9.6	70%
Water Hollow Tributary #2	1,155	53%	6.9	20.7	67%
Rocky Ridge Creek	739	37%	1.3	5.12	75%
				Average Infiltration Reduction =	**72%**

H. Adjusted Design Flow, (cfs per square mile): +91 csm = 164 (Average Post Fire)
Note: The design storm is a very localized (less than 4 mi^2) high intensity short duration storm. The csm estimates should not be applied to watershed larger than 5 mi^2.

Watershed	cfs/mi^2 (csm)				
	Pre-Fire	Post-Fire	Increase	% Increase	Weighted (csm)
Rolley Canyon	93	454	361	488%	290.47
Serviceberry Hollow	37	115	78	312%	77.09
Water Hollow Tributary #1	118	389	271	329%	217.68
Water Hollow Tributary #2	85	244	159	288%	156.03
Rocky Ridge Creek	30	114	84	377%	79.96
				Weighted post fire average csm=	164 csm

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:
An emergency condition does exist. The amount and location of high burn severity (4,820 acres, 22% of the burned area) and moderate burn severity (14,161 acres, 64% of the burned area) create a likely potential for unacceptable losses to private and state lands, downstream infrastructure, municipal water sources, the transportation system (USFS, UDOT, & County), soil productivity, and water quality.

Communities and Residences. The communities of Nephi and Fountain Green are located downstream of the burned area. A majority of the burned area is located within the Salt Creek

drainage. Salt Creek runs through Nephi City. Serviceberry and Indian Hollows drain into an intermittent channel that runs directly through Fountain Green. The flooding experienced in Fountain Green on 7/25/2007 was a result of ash/sediment bulked flows generated by thunderstorms in burned area. That storm also generated flooding in the Water Hollow-Salt Creek area. The burned area contains flood source areas that will directly influence the streamflows experienced in the City of Nephi and through Fountain Green.

Several other residences are located within and immediately downstream of the burned area. At a private campground, a home and two guest cabins are located immediately adjacent to stream channels. These areas could be affected by the increased bedload, sedimentation, ash-flows, and decreased water quality expected to occur.

Downstream Infrastructure. Juab County constructed four flood control structures along Salt Creek following the 1983 floods. One is located on the Uinta National Forest at Jenkins Flat downstream of the Salt Creek-Pole Canyon confluence. The other three are located downstream of NFS lands. These structures all currently provide some flood control, but the pond capacities have been reduced by sedimentation.

The Nephi Irrigation Company operates a diversion structure near the golf course just upstream of Nephi. A City of Nephi hydropower facility (diversion and power plant) are located along Salt Creek downstream of NFS lands.

Municipal Water Sources. The City of Nephi has two spring-fed water sources within the burned area. The fire burned on NFS lands upslope of Bradley Springs in the groundwater source protection area.

Transportation System. The transportation system is at risk due to the expected flooding and sediment movement. Of main concern is State Highway 132 downslope of NFS lands. Forest Service roads of concern include the Nebo Loop Road (FSR 70115), Pole Canyon (FSR 70116), Salt Cave Road (FSR 70163), and the Rocky Ridge Road. The Nebo Loop Road is a National Scenic Byway.

Water quality. Water quality will be reduced by increases in organic carbons, ash, and sediment. Initial (1-3 years) upland erosion and sediment delivery directly to stream channels is expected to be high in areas of high burn severity.

Ecosystem Integrity. The burned area contains crucial elk and deer winter range for the San Pitch, Nebo, and Wasatch Plateau mountain ranges.

There is a high potential for increased noxious and invasive weed infestations. Populations of musk thistle (Carduus nutans), houndstongue (Cynoglossum officnale), cheatgrass (Bromus tectorum), bull thistle (Cirsium vulgare), squarrose knapweed (Centaurea virgata), white top (Cardaria draba) and tamarisk (Tamarisk sp.) are present within the burned area. The loss of cover and the soil disturbance caused by the fire has created an “invasion window” for colonization by noxious weed species in previously un-infested areas. While pre-fire noxious weed acreage on NFS lands was not extensive, several noxious weed seed sources are located on private lands and other state and federal lands immediately adjacent to NFS lands.

B. Emergency Treatment Objectives:
Land Treatments: The overall objective of the land treatments is to stabilize severely burned areas that pose a threat to human life, property, and important natural resources. The

treatments are intending to stabilize specific areas by providing soil cover and reducing erosion, trapping sediment and reducing sedimentation, and reducing water repellency and improving infiltration. Weed monitoring and treatment is prescribed to maintain ecosystem integrity by preventing expansion of unwanted species.

- L1: Woodstraw Mulch Near Bradley Springs – Objective: To provide immediate ground cover and protect the municipal water source area upslope of Bradley Springs on NFS lands by stabilizing severely burned slopes to reduce surface erosion and decrease water quality risks near the spring.
- L2: Agricultural Straw Mulch – Objectives: 1) To provide immediate ground cover on severely burned slopes. 2) To reduce on-site soil erosion and water repellency in order to reduce flooding and sedimentation concerns downstream of the treatment areas. 3) To decrease the risk to downstream infrastructure and resources.
- L3: PAM-12 Treatments – Objectives: 1) To reduce on-site soil erosion and water repellency. 2) Reduce flooding and sedimentation concerns downstream of the treatment areas. 3) Decrease the risk to downstream infrastructure and resources.
- L4: Weed Monitoring and Treatment – Objectives: To maintain ecosystem integrity by retarding the invasion of undesirable weed species into the fire area. To encourage soil stabilization through the recovery of desirable plant species on severely burned lands.

Objective B - Channel Treatments:

- C1: Jenkins Flat Flood Control Pond Dredging – Objectives: 1) Dredge and stabilize this existing flood control structure to increase the sediment and water storage capacity. 2) Reduce the risk of flooding and flood-related impacts on downstream infrastructure and resources in the Salt Creek drainage (hydropower diversion, Nephi City, private residences, etc.); 3) Reduce the loss of water control; 4) Trap sediment.

Objective C - Roads: The overall objective of the road treatments is to reduce the risk of flood-related damage the road system, which is critical to the local economies, land management activities, and recreation.

- R1 and R2: Road Stabilization on Level 5 (paved) and Level 2 Roads – Objectives: 1) Stabilize and prepare the road system for the expected increases in streamflows. 2) Decrease flood damage to the road system. 3) Decrease the impact to downstream water quality.
- R3: Storm Inspection and Response – Objectives: 1) Inspect the road system immediately following storm events and spring runoff to identify and repair flood-related damage. 2) Protect human health and safety by ensuring the road system is safe for travel following storm events
- R4: Install culvert end section at Maple Springs drainage crossing on the Nebo Loop Road – Objectives: Increase the culvert efficiency to minimize risk of failure do to increase flows and debris.
- R5: Install imbricated rock-level spreader on Pole Canyon road – Objectives: 1) Protect and armor the fill-slope to reduce the risk of failure (slumping). 2) Reduce erosion from the expected increases in flow caused by the burn severity. 3) Reduce water quality impacts on downstream resources.

Objective D – Protection and Safety Treatments: The overall objective of these treatments is to protect life and provide for safety of employee implementing treatments and public safety.

- PS1: Flood Warning Signs – Objectives: 1) To alert drivers and Forest recreational users of the increased flash flooding potential created by the fire.

- PS2: Hazard Tree Removal – Objective: Remove hazard-tree trees located along the Pole Canyon road to reduce the risk to employees that will be implementing road work and aerial mulching/Pam12 treatments.

Objective F Monitoring: The objective of monitoring the prescribed treatments is to: 1) evaluate the success and/or failure of the treatments; 2) recommend adjustments to treatments; and 3) report on these findings to management.

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

Land: 70% Channel: 80% Roads/Trails: 70% Protection/Safety: 80%

Several storms occurred over the burned area during our assessment. Most storms were slightly smaller than the design storm. However, localized flooding in the town of Fountain Green resulted in damages to at least one home.

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80%	85%	90%
Channel	80%	80%	80%
Roads/Trails	75%	80%	85%
Protection/Safety	80%	85%	90%

E. Cost of No-Action (Including Loss): $9,530,600

F. Cost of Selected Alternative (Including Loss): $3,663,464 ($988,346 for the proposed treatments plus $2,675,118 of losses that may occur even with treatment)

G. Skills Represented on Burned-Area Survey Team:

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

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Pam Jarnecke, Environmental Coordinator, Uinta NF
Charmaine Thompson, Archeologist, Uinta NF
Denise VanKeuren, Plant Ecologist, Uinta NF
Ken Burton, GIS Specialist, Uinta NF
Lauren Shapiro, Fire Ecologist, Uinta NF
Ron Smith, Aquatic/Fisheries Biologist, Uinta
Ryan Stone, Engineer, Uinta NF

Renae Bragonje, Rangeland Management Specialist, Uinta NF
Karen Hartman, Wildlife Biologist, Uinta NF

H. Treatment Narrative: The attached specification sheets and treatment map provide additional information for each of the proposed treatments.

Land Treatments

L1: Woodstraw Mulch near Bradley Springs – Use a helicopter to aerially apply Woodstraw at 3 tons/acre.

- Cost = $3,296/acre x 22 acres = $72,512

L2: Agricultural Straw Mulch – Use a helicopter to mulch 426 acres. Some polygons are prescribed for 50% PAM12 and 50% agricultural-straw (Ag-straw will be use on slopes generally less than 50% and PAM12 will be applied on slopes greater than 50%).

- Cost = ~$1,100 acre x 426 acres = $465,130

L3: PAM-12 Treatments – Use a helicopter and seed hopper to spread PAM12 on the treatment polygons (see treatment map). Some polygons are prescribed for 50% PAM12 and 50% ag-straw (Ag-straw will be use on slopes generally less than 50% and PAM12 will be applied on slopes greater than 50%). Coordinate with NF Research Branch for monitoring of these treatments.

- Cost = $538/acre x 511 acres = $275,064

L4: Weed Monitoring and Treatment – Monitor to determine the presence of noxious weeds and invasive plant species. Spot-treat any small/isolated weed populations discovered. Monitor burned areas adjacent to existing known populations, along dozer lines, next to roads, and in riparian corridors (for tamarisk).

- Cost = $6,930

Channel Treatments

C1: Jenkins Flat Flood Control Pond Dredging – Juab County constructed four flood control structures along Salt Creek following the 1983 floods. One is located on the Uinta National Forest at Jenkins Flat downstream of the Salt Creek-Pole Canyon confluence. This structure currently provides for some flood control, but the pond capacity has substantially been reduced over time by sedimentation. Accumulated sediment will be dredged to increase the water and sediment storage capacity. Two alternatives exist to perform this treatment. In addition to dredging, the spillway outlet wing-walls will be armored with rip-rap.

- Cost = $96,200

Roads

R1 Road Stabilization on Level 5 (paved) Roads – Minimize the risk to the creek and Nebo Loop Road. The road drainage structures need to be improved to manage increased water flows. The cut side of the road should have ditches constructed that are large enough deliver collected water flows to culverts or run-out ditches. Clear all debris deposited in culverts. At the culvert inlet, construct large debris basins.

- Cost = $7,231/mile X 3.3 miles = $24,150

R2 Road Stabilization on Level 2 Roads – Minimize the risk to the streams and high clearance vehicle roads. This treatment is necessary to avoid roads collecting overland flow and discharge at concentrated points resulting in accelerated erosion and sedimentation. The fire has resulted in a significant potential for overland flow increase. The intent is not to improve roads, but to re-

establish and strengthen drainage structures capable of resisting failure from higher than normal burned area sheet and channel erosion flows and to facilitate the hardening of the road surface..

- Cost = $2,570/mile X 5.2 miles = $13,360

R3: Storm Inspection and Response – The roads listed at risk cannot be closed, and storm inspection/response will be more cost effective than modifying existing drainages. Storm inspection and response keeps culvert and drainage structures functional by cleaning sediment and debris from the inlet between or during storm events on roads where access is required. Storm inspection and response performed during the storm should meet safety considerations in the Job Hazard Analysis.

Work should be completed between or during storm events in the area, including spring runoff. Clear ditches on the cut-slope side of the road and ensure the efficient flow of water. Remove debris collected at the inlet of culverts. Clear sediment and debris in culvert. Repair large debris basins, excavated 4-6" lower than the pipe inlet. The bottom of the debris basin should be 2X the pipe diameter, or a minimum of 48". Slopes in the basin are to be 3:1. Lower slopes should be blended into the ditches that feed into the basin and culvert. Waste material should be sloped to conform to the natural slope to promote revegetation and reduce concentrated overland flows. Repair eroded or otherwise damage rolling drainage structures.

- Cost = $1,977/mile X 8.5 miles = $16,800

R4: Install culvert end section at the Maple Springs drainage crossing on the Nebo Loop Road – End sections are to be installed in the inlet ends of existing culverts at the crossing of the Maple Springs Drainage and the Nebo Loop Road. Design/Construction Specifications:

- Cost = $1,500

R5: Install imbricated rock-level spreader on Pole Canyon road – Install imbricated rock leveler, by excavating and placing 48" diameter rocks into the bottom of the fill slope and continue to interlock the rocks up the fill slope until the top of the fill slope is reached.

- Cost = $3,500

Protection and Safety Treatments:
PS1: Flood Warning Signs – Install flash flood warning signs at 1) start of the Nebo Loop Road (FSR 70115) at the intersection with Highway 132; 2) Jenkins Flat area where several interpretative signs are already in place; and 3) The intersection of the Pole Canyon road (FSR 70116) and the Nebo Loop road (FSR 70115).

- Cost = $300/sign x 3 signs = $900

PS2: Hazard Tree Removal – Remove hazard trees along the Pole Canyon to risks to human life and property.

- Cost = $5,300

I. Monitoring Narrative: See Attached Monitoring Plan. Cost = $7,000.

Part VI – Emergency Stabilization Treatments and Source of Funds

			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										
L1: Wood Straw	acres	$3,296	22	$72,512	$0		$0		$0	$72,512
L2: Agricultural Straw Mulch	acres	$1,092	426	$465,130	$0		$0		$0	$465,130
L3: PAM12 Treatments	acres	$538	511	$275,064	$0		$0		$0	$275,064
L4: Weed Monitoring/Treatment	Job	$6,930	1	$6,930	$0		$0		$0	$6,930
*Non-FS: Seeding (BLM/State)**	acres	$75	0	$0	$0	4,415	$331,125	1,830	$137,250	$468,375
*Non-FS: Seed/chaining (BLM/State)**	acres	$110	0	$0	$0	1,600	$176,000	250	$27,500	$203,500
*Non-FS: Weed Spray (BLM)**	acres	$100	0	$0	$0	2,360	$236,000		$0	$236,000
*Non-FS: Fence Repair (BLM)**	miles	$2,500	0	$0	$0	7	$17,500		$0	$17,500
Subtotal Land Treatments				**$819,636**	**$0**		**$760,625**		**$164,750**	**$1,745,011**
B. Channel Treatments										
C1: Jenkins Flat Dredging	Job	$96,200	1	$96,200	$0		$0		$0	$96,200
BLM Gully Plugs	dam	$100	0	$0	$0	106	$10,600		$0	$10,600
*Non-FS Pond Dredging**	Job	$100,000	0	$0	$0		$0	3	$300,000	$300,000
*Non-FS Water Hollow Reservoirs**	Job	$12,500	0	$0	$0		$0	2	$25,000	$25,000
*Non-FS Fountain Green Culvert**	Job	$5,000	0	$0	$0		$0	1	$5,000	$5,000
*Non-FS Serviceberry Dispersion**	Job	$75,000	0	$0	$0		$0	1	$75,000	$75,000
Subtotal Channel Treat.				**$96,200**	**$0**		**$10,600**		**$405,000**	**$511,800**
C. Road and Trails										
R1: Road Stabilization (level 5)	miles	$7,318	3.3	$24,150	$0		$0		$0	$24,150
R2: Road Stabilization (level 2)	miles	$2,569	5.2	$13,360	$0		$0		$0	$13,360
R3: Storm Inspection/Response	event	$2,400	7	$16,800	$0		$0		$0	$16,800
R4: Culvert end section (Maple)	job	$1,500	1	$1,500	$0		$0		$0	$1,500
R5: Imbricated rock (Pole Canyon)	job	$3,500	1	$3,500	$0		$0		$0	$3,500
*Non-FS County Road Stabilization**	Job	$2,500	0	$0	$0		$0	3	$7,500	$7,500
*Non-FS UDOT (Highway 132)**	Job		0	$0	$0		$0		$0	$0
Subtotal Road & Trails				**$59,310**	**$0**		**$0**		**$7,500**	**$66,810**
D. Protection/Safety										
PS1: Flood Warning Signs	sign	$300	3	$900	$0		$0		$0	$900
PS2: Hazard Tree Removal	job	$5,300	1	$5,300	$0		$0		$0	$5,300
Subtotal Structures				**$6,200**	**$0**		**$0**		**$0**	**$6,200**
E. BAER Evaluation										
Salary	Team		1	---	$42,000		$0		$0	$42,000
Travel					$1,000					
Helicopter use										
supplies										
				---	$0		$0		$0	$0
Subtotal Evaluation				**---**	**$43,000**		**$0**		**$0**	**$42,000**
F. Monitoring										
Annual Report	report	$7,000	1	$7,000	$0		$0		$0	$7,000
				$0	$0		$0		$0	$0
Subtotal Monitoring				**$7,000**	**$0**		**$0**		**$0**	**$7,000**
G. Totals				$988,346	$0		**$771,225**		**$577,250**	**$2,378,821**
Previously approved										
Total for this request				**$988,346**						

* Italics show BLM, State, and Private/NRCS treatments, which are FS estimates.

PART VII - APPROVALS

/s/ Brian Ferbee *8/6/07*
BRIAN FEREBEE Date
Forest Supervisor
Uinta National Forest

/s/ Rod Player *8/6/07*
ROD PLAYER Date
Acting Forest Supervisor
Manti LaSal National Forest

Jack Troyer Date
Regional Forester
Intermountain Region

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SALT CREEK FIRE
Initial BAER Report

Monitoring Plan

Salt Creek BAER Team

August 6, 2007

INTRODUCTION: Monitoring is the periodic assessment of BAER treatments to evaluate their success and/or failure, recommend adjustments to treatments and report on these findings to management. The objectives described in the Initial Assessment Report (2500-8) are summarized below:

- **Protection of human-life from fire-induced post-fire events**
  1. Prevent unacceptable adverse impacts from burn area generated sedimentation, debris flows, or flooding to property and infrastructure in Nephi City, Fountain Green City, and along Salt Creek.
  2. Minimize threat to public safety through hazard signage and culvert replacement on Highway 132.
  3. Minimize damage to transportation and utility infrastructure associated with the Highway 132 Corridor from debris and increased runoff.

- **Prevention of unacceptable degradation of water quality**
  1. Prevent unacceptable impacts to the Nephi municipal water source.
  2. Prevention of unacceptable adverse impacts to stream and riparian/fisheries habitat (i.e. sediment and ash impacts on water quality and habitat)

- **Protection of long-term soil productivity (i.e. preventing unacceptable levels of accelerated soil erosion)**
  Forest Service Manual 2523.03 directs that the implementation and effectiveness of treatments, as well as the consequences of decisions not to treat certain areas, will be monitored. This plan will assess BAER measures taken to assist in rapid recovery of the burned sites and nearby lands and resources affected by the burned sites. Direction in this monitoring plan complies with the Uinta National Forest Land and Resource Management Plan. The Forest Service Handbook 2509.13, Section 61.1 requires that, as a minimum, the following conditions be monitored:

  1. The effectiveness and proper functioning of stabilization measures, especially road drainage facilities and channel structures.
  2. Need for re-treatment, maintenance and removal of temporary structures.
  3. Quality and quantity of water leaving the burned area and the location and causes of the problem
  4. Rate of recover of vegetation.
  5. Effects of resource utilization, restoration activities and emergency stabilization measures on each other.

District and Supervisor's Office personnel (with any requested assistance) will be assigned by the Leadership Team to conduct the implementation and the effectiveness monitoring (FSH 2509.13 Section 61.04).

IMPLEMENTATION MONITORING: The purpose of implementation monitoring is to determine if the treatments were completed as prescribed. Implementation monitoring is part of, and except as noted, is included in the costs of conducting the specific treatments. Project inspectors will evaluate land

treatments during implementation to assure contract specifications are being met. Some of the critical contract implementation questions for the contracting officer's representative (COR) or project leader are:

1. **AgStraw and WoodStraw Mulching:**
   - Was the straw product certified to be free of noxious and other undesirable weeds?
   - Were straw moisture conditions acceptable for spreading the mulch?
   - Was the straw delivered to the staging area/helispot when needed for the treatment?
   - Did the treatment areas receive the volume of mulch prescribed?
   - How uniformly was the mulch distributed across the treatment areas?

2. **PAM-12 Application:**
   - Was the product delivered to the staging area/helispot when needed for the treatment?
   - Did the treatment areas receive the volume of Pam-12 prescribed?
   - How uniformly was the Pam-12 distributed across the treatment areas?

3. **Road Treatments:**
   - Were dozer line segments treated (seeded & water-barred) to specifications in the Suppression Rehabilitation Plan description?
   - Do the "as-built" treatments match the BAER plan prescriptions?
   - Was the Storm Monitoring effective?

4. **Noxious Weed Treatment**:
   - Was equipment used washed prior to entering area?

5. **Untreated Burned Area Monitoring:**
   - Were untreated areas further disturbed during implementation?

6. **Costs for All Treatments:**
   - Were the costs of the treatments as projected?

EFFECTIVENESS MONITORING: This monitoring is specifically designed to answer the question: Did the BAER treatments provide the planned protection and stabilization of the burned area? Said another way, have the objectives of the treatments been met and if not, why? The purpose is NOT to prove, for example, that increased ground cover reduces erosion; rather, it is to see if the ground cover improvement treatment implemented increased ground cover as desired.

Per the Forest Service Handbook (2509.13, 62.23), this monitoring includes on-the-ground review by a team of emergency response specialists, normally 2-3 growing seasons after the burn but may also be after the first runoff season or after unusual climate. Funds ($7,000) for the first year of this monitoring have been approved through the initial 2500-8. Funds for monitoring beyond year one must be requested annually. Both successes and failures are to be addressed, along with reasons. Sensitive areas are given priority. This monitoring evaluates if the emergency treatments are successful in:

- Protecting long-term soil productivity,
- Preventing the deterioration of water quality,
- Reducing the threats to human life and property and allowing for the management of ecosystems in their properly functioning condition, and

Specific objectives of the treatments are described below:

1. Agricultural Straw and WoodStraw Mulching – A protective layer of surface mulching material spread on the soil surface in order to:
   - Reduce hillslope erosion and stream sedimentation
   - Protect soils from wind and hillslope sheet erosion

- Maintain long-term soil productivity and soil hydrologic conditions on severely burned sites
- Encourage soil stabilization and healing of hydrophobic soil conditions
- Helps promote vegetation regeneration to achieve long-term soil productivity
- Conserve soil moisture, maintain a more even soil temperature, and provide protection from rain-drop splash and impact, thus lessening soil erosion.

2. PAM-12 Application – surface mulch composed of recycled paper pellets containing polyacrylamide spread on top of the soil in order to:

- Reduce hillslope erosion and stream sedimentation
- Improves soil structure
- Increases water infiltration and soil water retention
- Reduce hillslope erosion and stream sedimentation
- protects soils from wind and sheet erosion
- Maintain long-term soil productivity and soil hydrologic conditions on severely burned sites
- Helps promote vegetation regeneration to achieve long-term soil.

3. Road Treatments:

- Post-storm surveys of culverts and roads. Maintenance of ditches, culverts, and identified roads will be completed as needed.

4. Noxious Weed Treatment:

- Monitor and treat noxious weeds inventoried in the fire perimeter

General Data Collection Procedures - The information to be recorded and documented will include the dates and type of emergency treatments implemented along with the total number of structures, acres and actual costs associated with these stabilization projects. Photos will be taken before and after these treatments and locations will be plotted using Global Positioning Systems (GPS). These photo points will be established above, within and below the various treatments. All photos will be collected using a digital camera in order to easily enter the images into interim and final monitoring reports. Any monitoring item having a specific location will be mapped using Global Positioning Systems (GPS) and loaded into the corporate Geographic Information System (GIS) database (e.g., weed infestations). The Implementation Team leader will ensure that all data being collected meets the established standards. Data collected for inclusion into the Forest GIS database will meet corporate standards. For all monitoring projects, as a minimum, record:

- Dates of installation or accomplishment,
- Name(s) of person(s) collecting data and name of person, organization, or contractor performing work with a lead contact name if possible,
- Types of equipment used,
- Time for project completion (length of treatment),
- GPS location as well as a detailed map and narrative of directions to the site,
- Narrative explaining how the job was completed, any problems encountered and how they were solved,
- Recommendations for continued use of the treatment on other fire stabilization projects considering both implementation and effectiveness concerns, and
- Evaluation of whether treatments supported the “minimum necessary” goal.

Specific Data To Be Collected - Specific data to be collected during and throughout the monitoring process include:

Soils and Hydrology:

- Establish photo points
- Describe and map evidence of mass wasting, soil movement, and deposition

- Describe the effectiveness of the culvert replacements. Note if additional treatments or maintenance are needed.
- Monitor soil conditions to document hillslope treatment success and decline in hydrophobic conditions.
- Collect and compile rain data using rain gauges

Noxious Weeds:

- GPS map of dozer lines constructed to contain the Salt Creek Fire
- GPS map of travel-ways that cross the dozer lines and access the interior of the fire
- Annual assessment of the magnitude of infestations, including the following information:
  - GPS map of locations and perimeters or points of infestations
  - Estimates of number of plants per square foot
  - Copies of appropriate Pesticide Use Proposals and Pesticide Use Reports for treatment of target weed species
  - Record of treatment activities (dates, treatment methods, chemicals used)
  - Evaluation of treatment success.

Interim Evaluations - The Implementation Team Leader will conduct an annual evaluation within one year of fire control. Second and third year periodic evaluations (annually as a minimum) with the District and Forest implementation team would be desirable; however, funding for these will have to be requested annually. The purpose of these evaluations is to assess implementation progress, effectiveness monitoring and to determine if parameters measured and sampling frequency meet the planned objectives.

Reports - A progress report will be prepared prior to the end of the first calendar year following fire control. Future reports will be prepared if authorized following 2nd and 3rd year funding requests. The reports will be submitted to the Forest Supervisor, other unit District Rangers, the Regional Office and all cooperating agencies and other interested parties.

Annual Financial Requirements - The annual cost of effectiveness and validation monitoring is itemized in the following table. The total cost for Year 1 is $7,000.

Monitoring Cost Summary	Year 1
Monitor burn area and treatment polygons for soil erosion (rill or gully formation), hydrophobic soil conditions, mulch effectiveness, and complete report.	$3,000
Monitor Effectiveness of Pam-12/Coordinate with FS Research Branch	$2,000
Monitoring Reconnaissance flight of Salt Creek Fire (~2 hours helicopter time)	$1,400
Supplies	$100
Monitoring - Noxious Weed	$500
Total	**$7,000**