

Date of Report: 9 October 2009

PART I - TYPE OF REQUEST

- ☒ 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)

A. Fire Name: Lake Fork

B. Fire Number: 2009 UTMLS 9076

C. State: Utah

D. County: Utah County

E. Region: 4

F. Forest: Manti-La Sal

G. District: Price, administered by Sanpete

H. Fire Incident Job Code: P4E0NP

I. Date Fire Started: 7/2/2009

J. Date Fire Contained: not yet contained

K. Suppression Cost: \$800 K

L. Fire Suppression Damages Repaired with Suppression Funds

1. Repair H2O troughs, headbox, & enclosure (acres/cost) : 2 acres/\$7,000

M. Watershed Number:

HUC6 (160202020205)

HUC6 (160202020204)

N. Total Acres Burned: 2200

NFS Acres(**2200**) Other Federal () State () Private ()

O. Vegetation Types:

The elevation of the burned area varies from 6400 feet to 8400 feet resulting in a wide types. However the predominant vegetative covers are as follows:

Lake Fork Vegetation by acres

Vegetation Type	Sum of Acres	% of Area
Barren Rock Outcrop or Ledge	17	1
Basin Big Sagebrush	34	2
Big Mountain Sagebrush	64	3
Curlleaf Mountain Mahogany	177	8
High Mountain Brush	3	0
Mountain Brush	171	8
Oakbrush	401	18
Pinyon Juniper Woodland	742	34
Rocky Mountain Juniper Woodland	294	13
White Fir Forest	296	13
Grand Total	2199	100

P. Dominant Soils:

Soils are mapped by the Manti-La Sal National Forest. All soil mapping units for the Lake Fork Fire area are documented in UT645 Soil Survey for the Manti-La Sal National Forest, Parts of Sanpete and Emery Counties. Dominate soils affected include soil mapping units include:

Lake Fork Soils Map Unit by acres

Soil Map Unit	Sum of Acres	% of Area
34	176	8
145	306	14
145A	293	13
223	571	26
223A	853	39
Grand Total	2199	100

Depending on location within the area, soil textures are derived from:

Lake Fork Soils

Soil Map Unit	Landform	Geologic Material	Geologic Formation	Soil Texture (% of SMU)
34	Mountain sides and alluvial fans	Shale & alluvium from shale	North Horn	SiCL or SiC (80%)
145	Steep complex mountain slopes and canyons	Sandstone, shale, and conglomerate	North Horn Price River	VGR VCB L or SiL (50%) GR CB L (35%)
145A	Steep complex mountain slopes and canyons	Sandstone, shale, and conglomerate	North Horn Price River	GR VGR L (40%) GR VGR CB VCB L or SiCL (30%) L or GR L (20%)
223	Complex mountain slopes and canyons	Sandstone, shale, and conglomerate	North Horn Price River	GR VGR L (55%) GR VGR CB VCB L or SiCL(30%)
223A	Complex mountain slopes and canyons	Sandstone, shale, and conglomerate	North Horn Price River	VGR VCB L or SiCL (40%) GR CB CL or L (30%) VGR VCB L, SiL or SL (20%)

Q. Geologic Types:

The area that the Lake Fork Wildfire burned over is within the geologically complicated, Sevier Thrust System. The specific geologic unit in the area of the fire is known as the North Horn Formation and dates back to the late cretaceous period. This unit is comprised of interbedded mudstones and siltstones and is prone to landslides, slumps and failures.

R. Miles of Stream Channels by Order or Class:

First Class: 2 miles

Second Class: 2 miles

S. Transportation System

Trails: 4 miles

Roads: 1 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 192 (low/unburned) 1360 (moderate) 98 (high)

Lake Fork Fire Burn Severity by Acres

Burn Severity	Sum of Acres	% of Acres
high	98	4
moderate	1360	62
light	192	9
unburned or light	543	25
Grand Total	2193	100

B. Water-Repellent Soil (acres): 98

C. Soil Erosion Hazard Rating (acres):

532 (unburned) 244 (low) 632 (moderate) 764 (high)

D. Erosion Potential: 16 tons/acre

E. Sediment Potential: 10,240 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS**

- A. Estimated Vegetative Recovery Period, (years): 3
(for dominant veg Gambel Oak and Mnt Brush; grasses, forbs and Mnt Brush in PJ community and Timber)
- B. Design Chance of Success, (percent): 80
- C. Equivalent Design Recurrence Interval, (years): 5 and 10
- D. Design Storm Duration, (hours):
- E. Design Storm Magnitude, (inches):
- F. Design Flow, (cubic feet / second/ square mile):
- G. Estimated Reduction in Infiltration, (percent): 10%
- H. Adjusted Design Flow, (cfs per square mile):

Cox Canyon	5Yr Pre Fire	5 Yr Post Fire	10 yr Pre Fire	10 yr Post Fire
	27 cfs	32 cfs	37 cfs	44 cfs
	0.6 cfs/sq mi	0.7 cfs/sq mi	0.8 cfs/sq mi	0.9 cfs/sq mi
Ives Canyon	5Yr Pre Fire	5 Yr Post Fire	10 yr Pre Fire	10 yr Post Fire
	22 cfs	26 cfs	30 cfs	36 cfs
	0.035 cfs/sq mi	0.041 cfs/sq mi	0.08 cfs/sq mi	0.09 cfs/sq mi
Dry Canyon	5Yr Pre Fire	5 Yr Post Fire	10 yr Pre Fire	10 yr Post Fire
	111 cfs	138 cfs	148 cfs	185 cfs
	1.6 cfs/sq mi	2.0 cfs/sq mi	2.2 cfs/sq mi	2.7 cfs/sq mi

Flows determined using USGS Water Supply Paper 2433 – Methods for Estimating Magnitude and Frequency of Floods in the Southwestern United States 1997 and adjusted based upon the BARC map.

** Hydrologic design factors are being determined and will be supplied within the next two.

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The following values were identified by the BAER team: Eagles Landing subdivision and infrastructure; Hwy 89; private lands which include Pines Valley Ranch, various ranches, homes, barns, sheds, access roads on the private property; and natural resource values, principally soil productivity within high erosion burned timber areas.

The Lake Fork Fire started on July 2, 2009 from lightning, and was allowed to burn as a resource benefit fire to help reduce fuel loading and improve long-term watershed condition. In mid September 2009, there were two storm events (2-in/hr and 1-in/hr) which resulted in high hillslope runoff rates, high soil erosion, flashfloods, and debris flows. Within the high burn severity area, nearly an inch of topsoil was lost from sheet flow and rilling. The moderate burn severity areas experienced high sheet flow with some topsoil loss. Both events resulted in flashfloods, debris flows and high sedimentation rates in most drainageways below moderate and high burn severity hillslopes. Most drainageways are now scoured and have a high sediment load. Affected hillslopes will continue to experience high soil erosion, with accompanying mud-debris flows within drainages and streams below the burn area with future storm events.

A reduction in the short-term soil loss is critical for maintaining longterm soil productivity and future protection of the watershed and identified values at risk. Private lands outside the forest boundary are at continued risk for flooding, channel entrenchment and damage to irrigation systems, roads, homes, ranches, sheds, barns and other improvements. There is a concern for public safety from flash floods and debris flows within and outside the Forest boundary.

Hwy 89 is designated as Utah's Heritage highway. This designated highway runs from Thistle Junction and passes to the west below the burn area in Utah County. The highway is an important by-way for the area for access to the Wasatch Front, for commuters, and is actively promoted for tourism. This road has already been impacted from the storm events which resulted in mud/debris flows from the burn area covering the road and partially plugging culverts.

B. Emergency Treatment Objectives:

- Reduce hillslope runoff from moderately steep to very steep source areas in several, upper watersheds that have high and moderate burn severity conditions. Reduce further damage and help mitigate flash flood and debris flow impacts to identified values at risk. Reduce soil erosion and help protect soil productivity. Soils within these locations have high to moderate soil hydrophobicity, and have already experienced loss of topsoil from sheet flow and rilling during several storm events.

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

Land 80 % Channel ___ % Roads/Trails ___ % Protection/Safety ___ %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land			
WoodStraw with PAM-12	80	80	90
PAM-12	60	70	80
Channel			
N/A			
Roads/Trails			
N/A			
Protection/Safety			
N/A			

E. Cost of No-Action (Including Loss): 2,050,000

F. Cost of WoodStraw plus PAM-12 mulch (Including Loss): 737,840

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range	<input type="checkbox"/>
<input type="checkbox"/> Forestry	<input checked="" 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 type="checkbox"/> Botany	<input type="checkbox"/> Archaeology	<input type="checkbox"/>
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input type="checkbox"/> GIS	

Team Leader: Bob Davidson

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FAX: 435.654.5772

H. Treatment Narrative:

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

Land Treatments:

Land Treatments consist of wood-straw mulch plus PAM-12 mulch, and PAM-12 mulch only. The mulching areas are located in the upper watershed source areas within the burn, on steep facing slopes. The purpose of the mulch is to protect soils on steep slopes from raindrop impact, to reduce the event energy at the watershed-head source areas, reduce hydrophobicity, increase water infiltration, minimize soil erosion and debris-particle entrainment in the runoff at the source areas, and promote re-vegetation from seed germination and seedling survival.

Wood Straw Mulch plus PAM-12 mulch – fine-textured silty clay loam soils located on 62 acres are proposed for PAM-12 mulch; 20 acres within the 62 acres are proposed for WoodStraw mulch, thus have double treatment on the 20 acres of both WoodStraw and PAM-12 mulch. The 62 acres are located on slopes 35% to 100%, on north facing timber slopes in high burn severity, with soils having high water repellency. Wood straw mulch will provide litter cover protection from raindrop impact for many years following treatment on the treated 20 acres, allowing extra time as vegetation reestablishes since timber areas take much longer to rehabilitate following a fire. PAM-12 will reduce soil hydrophobicity, increase water infiltration, and provide soil moisture for seedling germination and survival. is appropriate for these areas because the wood straw is stable on steeper slopes.

PAM-12 Mulch –149 acres are proposed for PAM-12 only mulch. These areas are located in two separate watersheds on burned over PJ with very rocky, fine-textured soils having loam and silty clay loam textures. Slopes are 40% to 100% with moderate burn severity, and on soils having moderate water repellency. Pinyon Juniper woodlands and mountain brush vegetation areas rejuvenate faster than timber areas; however, because there is greater surface rock content, there is greater runoff and reduced water infiltration than there would be otherwise. Therefore, the PAM-12 will help reduce soil hydrophobicity, increase water infiltration, and provide soil moisture for seedling germination and survival.

Seeding – 62 acres of high burn severity are proposed for seeding. Topsoil has been eroded off this unit during two separate storm events that took place in September 2009, thus removing native, intrinsic seed source. Without a native seed bank, rehab will occur very slowly, thus allowing this unit to continue to be an emergency threat to major storm events in the future, resulting in potential flash floods to Blind Canyon. Seeding will help replace native seed lost during the topsoil removal and allow this unit to add protection to the watershed and help retain both short term and long-term soil productivity. The PAM-12 mulch has been shown to increase water infiltration, and provide soil moisture for seedling germination and survival.

Seed Mix:

Application rate is 13 pounds PLS per acre, 56 pls/sq ft

Grasses	Seeds/pound	\$/lb	Seed mix rate (lbs/ac)	Cost per ac
Western Wheatgrass, <i>Agropyron smithii</i> (N)	110,000	\$3.00	2	\$6.00
Wheatgrass, Slender, <i>Agropyron trachycaulum</i> (N)	159,000	\$3.00	2	\$6.00
Mountain Brome, <i>Bromus carinatus</i> (N)	64,000	\$3.00	2	\$6.00
Bluegrass, <i>Poa secunda</i> (canbyi) (N)	926,000	\$4.50	1	\$4.50
Bluebunch Wheatgrass, <i>Agropyron spicatum</i> (Secar) (N)	140,000	\$5.00	2	\$10.00
Thickspike Wheatgrass, <i>Elymus lanceolatus</i> (N)	154,000	\$4.50	2	\$9.00
Basin Wildrye, <i>Elymus cinereus</i> (N)	130,000	\$6.00	2	\$12.00
			13	\$53.50

Forbs

Channel Treatments:

None proposed

Roads and Trail Treatments:

None proposed

Protection/Safety Treatments:

In the case of a storm event of concern, the NWS would contact the Utah County Emergency Services directly, as well as issuing an alert in their normal manner.

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #

			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											
WoodStraw mulch	acres	3800	20	\$76,000	\$0			\$0		\$0	\$76,000
PAM-12 mulch	acres	600	212	\$127,200							\$127,200
Seeding	acres	119	62	\$7,378							\$7,378
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Land Treatments				\$210,578	\$0			\$0		\$0	\$210,578
C. Road and Trails											
				\$0				\$0		\$0	\$0
				\$0	\$0			\$0		\$0	\$0
				\$0							\$0
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				\$0	\$0			\$0		\$0	\$0
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Road & Trails				\$0	\$0			\$0		\$0	\$0
D. Protection/Safety											
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Structures				\$0	\$0			\$0		\$0	\$0
E. BAER Evaluation											
				---				\$0		\$0	\$0
Insert new items above this line!				---	\$0			\$0		\$0	\$0
Subtotal Evaluation				---	\$0			\$0		\$0	\$0
F. Monitoring											
contract	acres			\$0	\$0			\$0		\$0	\$0
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0			\$0		\$0	\$0
G. Totals				\$210,578							\$210,578
Previously approved											
Total for this request				\$210,578							

PART VII - APPROVALS

1. /s/Rod Player for PAMELA E. BROWN
Forest Supervisor (signature)

October 13, 2009
Date

2. /s/Jerome Perez for HARV FORSGREN
Regional Forester (signature)

October 15, 2009
Date