

Date of Report: 007/15/02

BURNED-AREA REPORT
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST**

A. Type of Report

- ☒ 1. Funding request for estimated WFSU-SULT funds
☐ 2. Accomplishment Report
☐ 3. No Treatment Recommendation

B. Type of Action

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)
☐ 2. Interim Report
 ☐ Updating the initial funding request based on more accurate site data or design analysis
 ☐ Status of accomplishments to date
☐ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTIONA. Fire Name: Missionary Ridge ComplexB. Fire Number: CO-SJF-26804C. State: ColoradoD. County: La PlataE. Region: 02F. Forest: San JuanG. District: ColumbineH. Date Fire Started: 06/09/2002I. Date Fire Contained: 07/14/02J. Suppression Cost: \$38,500,000 as of 07/15/02

K. Fire Suppression Damages Repaired with Suppression Funds:

1. Fireline waterbarred (miles): in progress, no estimate available (117 Miles fireline constructed)
2. Fireline seeded (miles): in progress, no estimate available (117 Miles fireline constructed)
3. Other (identify):

L. Watershed Number:

M. Total Acres Burned: 70,662 (7/11/02 fire perimeter)

NFS Acres(62,934) Other Federal (691 - BLM) Colorado State Land (255) Private (9066) (based on 07/01/02 perimeter)

N. Vegetation Types: Spruce-Fir, Aspen, Ponderosa Pine, Pinyon-Juniper, Mountain Shrubland, Mountain Grassland

O. Dominant Soils: The soils are typically classified as alfisols (forest soil with an illuviated clay horizon). Three major types of alfisols occur, including alfisols with a semi-arid soil moisture regime (ustalFs), a udic, or "typical" alfisol (udalfs) and soils that occur in cold temperatures (cryalFs).

P. Geologic Types: Geology is associated with mixed sediments of the Cutler, Rico, Hermosa, Molas, Mancos Shale, Morrison and Dakota/Burro Canyon Formations.

Q. Miles of Stream Channels by Order or Class:

Order 1:	407 Miles
Order 2:	161 Miles
Order 3:	76 Miles
Order 4:	33 Miles
Order 5:	7 Miles
Order 6:	3 Miles

R. Transportation System:
 Trails: 52 miles Roads: 123 miles System Roads

PART III - WATERSHED CONDITION

- A. Burn Severity (acres): 13,872 (low) 21,822 (moderate) 22,541 (high)
- B. Water-Repellent Soil (acres): Mild surface hydrophobicity throughout the fire
- C. Soil Erosion Hazard Rating (acres):
 52,963 (low and moderate) 20,000 (severe)
- D. Erosion Potential: 25 tons/acre
- E. Sediment Potential: High Severity Watersheds: 65,324 cubic yards / square mile (due to sediment and debris)
 Low Severity Watersheds: 25,233 cubic yards / square mile (due to sediment and debris)

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period, (years): 3-5
- B. Design Chance of Success, (percent): 59%
- C. Equivalent Design Recurrence Interval, (years): 10
- D. Design Storm Duration, (hours): 1
- E. Design Storm Magnitude, (inches):

	Design Storms			
	1 year	5 year,	25 year,	50 year,
30 minutes	0.35"	0.70"	1.10"	1.30"
1 hour	0.50"	0.90"	1.30"	1.50"
6 Hours		2.20"	3.00"	3.40"

- F. Design Flow, (cubic feet / second/ square mile): 1344
- G. Estimated Reduction in Infiltration, (percent): 95%
- H. Adjusted Design Flow, (cfs per square mile): 1277

PART V - SUMMARY OF ANALYSIS

(For a more detailed description of the analysis see the Missionary Ridge Complex Burned Area Emergency Stabilizations and Rehabilitation Plan.)

The Missionary Ridge Complex consists of two fires: the Valley Fire (400 acres) and the Missionary Ridge Fire (38,100) totaling 38,500 acres adjacent to Durango Colorado. The Valley Fire occurred on West side of the Animas valley. The Missionary Ridge Fire burned the steep drainages of the east animas valley and large portions of the watersheds above and below the Lemon and Vallecito Reservoirs.

A. Describe Watershed Emergency:

(1) Watershed Response: Approximately 44,363 acres of the Missionary Ridge Complex experienced moderate to high burn severity. In these areas watershed response is expected to be high. Increased runoff is likely to cause hillslope erosion and mobilize sediments currently stored in the drainages. Recovery of grasses, forbs and shrubs is expected to occur in most areas within 3 to 5 years. Some high severity areas may not fully recover for ten or more years. Once the vegetation has recovered the watershed is expected to return to pre-fire conditions.

There are approximately 687 miles of perennial, intermittent, and ephemeral streams. Streams that may not have flowed water recently are expected to flow significant amounts of water after thunderstorms for the next several years. Watershed response is predicted to be significant in those areas with a high severity burn pattern and large, steep drainages. A storm that yielded approximately 0.3 inches of precipitation on July 3, 2002 developed ash and mud flows along the western edge of the Missionary Ridge Fire. Additional monsoonal rain events have yielded debris flows in many of the watersheds with moderate and high severity burn patterns.

The majority of the watersheds within the Missionary Ridge Complex are not expected to recover for 3 to 5 years with some not recovering for another 10 years. There will be cumulative effects from this complex of fires several miles downstream.

(2) Values at risk: Users of roads and trails as well as people living downstream from the burn are at risk of death or injury from possible high flows originating within the burn. At least 35 private residences are at high risk of flooding along with access roads to private residences particularly those in the Animas Valley and the Vallacito Reservoir areas. Two archeological sites on federal land are potentially at risk from sedimentation and erosion. Both county highways and forest system roads are at risk from both culvert plugging and debris flow. Certain trees, along roads, damaged or killed by the fire pose an immediate threat to public safety. Additional values at risk include irrigation ditches throughout the burned area, commercial buildings, Lemon Reservoir, Vallacito Reservoir, Lemon Dam Spillway, and water supplies to Bayfield, the Ute Reservation and the city of Durango. Many areas near and within the burn are infested with noxious weeds.

Emergency Treatment Objectives: Armored dips are planned for several locations on roads to allow floodwaters to flow over roads without doing damage. Trees posing an immediate hazard to workers or the public along roads and campgrounds will be removed. Seeding is proposed for approximately 15,000 acres of burned land. Noxious weed will be controlled and monitored to prevent their spread inside and adjacent to the burned area. aerial seeding, mulching, and log erosion barriers will be used to decrease erosion, stabilize slopes, and increase infiltration. A diversion structure will be placed at Lemon Reservoir to protect the spillway.

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

Land 50 % Channel % Roads 50% % Other 100 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	50%	75%	90%
Channel			
Roads	90%	90%	90%

Other	100%	100%	100%

E. Cost of No-Action (Including Loss):_ \$9,700,000

F. Cost of Selected Alternative (Including Loss):_ \$7,600,000

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input checked="" type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range	<input type="checkbox"/>
<input checked="" type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input checked="" type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input type="checkbox"/>
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fisheries	<input checked="" type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

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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

Aerial Seeding - Seeding will serve as an immediate and long-term ground cover to increase infiltration decrease surface erosion, help in prevention and spread of non-native and noxious weed species. Local resource specialists including ecologists and range conservationists, assisted with development of the seed prescription. Annual rye is not expected to persist beyond five years. The forest may need to fund additional seeding in some areas where natives do not return due to competition with the annual rye.

West side of Missionary Ridge and the Valley Fire:

Seed	pounds/acre	seeds/square foot	Cost/PLS
Spring wheat	12	3.9	\$0.14/lb
Annual rye	7	36.5	\$0.45b
Mt. Brome	3	6.2	\$2.30
Slender Wheatgrass	2.5	9.1	\$1.30
Western Wheatgrass	2.5	6.3	\$2.50
Total	27	62	

Seed: West side of Missionary Ridge and Valley Fire 5678 acres X \$23.48/acre

South Missionary Ridge and the Florida River drainage

Seed	pounds/acre	seeds/square foot	Cost/PLS
Spring wheat	8	2.6	\$0.14/lb
Annual rye	4.5	23.5	\$0.45b
Mt. Brome	4	8.3	\$2.30
Slender Wheatgrass	8	2.6	\$1.30
Western Wheatgrass	4	10.1	\$2.50
Total	24.5	59	

Seed: South side of Missionary Ridge and Florida River drainages 3276 acres X \$37.52/acre

Pine River drainage

Seed	pounds/acre	seeds/square foot	Cost/PLS
Spring wheat	8	2.6	\$0.14/lb
Annual rye	5.5	28.7	\$0.45b
Mt. Brome	6	12.4	\$2.30
Slender Wheagrass	4	14.6	\$1.30
Total	23.5	58.3	

Seed: Pine River drainage 6006 acres X \$33.52/acre

Non-Native Invasive Plant Control – Areas with a high risk of noxious weed invasion will be evaluated yearly. Areas within the burn invaded by noxious weeds will be sprayed to prevent further spread.

Log and Other Erosion Barriers – Log erosion barriers will installed in areas throughout the fire primarily to increase infiltration, reduce rill and gully formation, and reduce flood peaks. Other material such as straw waddles may be substituted for logs in some locations. Treatments will be installed in high severity areas that are less than 40% slope.

Early Warning System – Twelve precipitation gauges will be in or near the fire perimeter to provide early flood warnings to persons at risk from flood and debris flows generated within the fire area. The USGS will install and maintain the gauges. Data from the gauges will be delivered near real time to the National Weather Service for flood forecasting. Flood forecasts will be disseminated through the County 911 system.

Straw Mulch – Straw mulch will be applied at rate of 2000 pounds per acre above the Florida river. The mulch will reduce ash and erosion transport to the City of Durango water supply intake.

Channel Treatments

Debris Jam Patrol and Removal – A number of burned watersheds tighten into narrow slots at the bottom of the drainages. Log debris jams are likely to form in these locations. These canyons will be flown after storms to identify debris jam locations. Debris jams identified would be removed.

Road and Trails

Culvert Repair, Replacement and Cleaning - Culvert capacity will be increased to handle expected increases in flows in and downstream of the fire area. New culverts will be installed, existing undersized pipes will be replaced with larger pipes and many existing pipes will be cleaned. Culvert treatments have been designed in conjunction with grade dips to pass expected flows.

Grade Dips – Grade dips will be installed to increase stream crossing capacity, improve road drainage, and prevent road capture of post fire flood flows.

Road/Trail Storm Patrol – Roads and trails will be patrolled after storms to mitigate effects of floods so further damage does not occur.

Safety Sign Installation – Safety signs will be installed along roads and trails to identify areas that pose a risk to public safety. Some road and trail signs needed for public safety were damaged by the fire and will be replaced.

Replace/Improve Trail Drainage Structures – The drainage systems of trails within and downslope of the fire area are inadequate to handle expected flows. Drainage will be improved with waterbars, tread stabilization, and armoring.

BAER Evaluation

Engineering Assessments of Slumps and Spillway – Two engineering evaluations and designs could not be completed with the expertise found on the forest or BAER team. Numerous stable slumps were identified within the Coon creek drainage above a private residence. The toes of the slumps occur below the expected high water mark of future flood events. An engineering assessment will be conducted to determine the risk of failure and propose and design mitigation treatments. Another evaluation and design is needed for a diversion structure above the spillway of Lemon Dam Spillway. Debris flows are expected impact the spillway. A engineering assessment will be conducted to design a diversion structure on National Forest System Lands to divert flows away from the spillway.

Site Risk Assessments – A number of campgrounds within the fire perimeter are at risk from flooding and debris flows. A more extensive evaluation than could be conducted during the BAER assessment is needed to evaluate risk and potential mitigation.

Native American Consultation – Consultation will be required prior to implementation of many ground disturbing treatments. This specification provides funding for the consultation costs.

Monitoring

Treatment Monitoring – Monitoring will be conducted to determine if BAER treatments were effective in reducing the effects of fire on erosion and runoff. The forest will also monitor for the spread of noxious weeds. The forest will submit a detailed monitoring plan later for approval.

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

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands				All Total \$
			# of	WFSU		# of	Fed	# of	on Fe	
			Units	SULT \$		unit	\$	Units	\$	
A. Land Treatments										
Aerial Seeding	acres	\$39.27	14950	\$587,105			\$0		\$0	\$587,105
Non-Native Invasive Plant Control	acres	\$5.14	70000	\$360,000			\$0		\$0	\$360,000
Log Erosion Barriers	acres	\$460.87	3750	\$1,728,275			\$0		\$0	\$1,728,275
Early Warning System	each	\$22,040.00	12	\$264,476			\$0		\$0	\$264,476
Straw mulch	acres	\$517.71	170	\$87,840			\$0		\$0	\$87,840
<i>Subtotal Land Treatments</i>				<i>\$3,027,696</i>			<i>\$0</i>		<i>\$0</i>	<i>\$3,027,696</i>
B. Channel Treatments										
Debris Jam Patrol	hours	\$1,289.00	15	\$19,335			\$0		\$0	\$19,335
<i>Subtotal Channel Treat.</i>				<i>\$19,335</i>			<i>\$0</i>		<i>\$0</i>	<i>\$19,335</i>
C. Road and Trails										
Hazard Tree Removal	miles	\$1,422.00	58	\$82,450			\$0		\$0	\$82,450
Culvert repair, replacement and cleaning	culverts	\$7,413.00	66	\$489,256			\$0		\$0	\$489,256
Grade dips	each	\$6,926.00	65	\$234,677			\$0		\$0	\$234,677
Road/Trail storm patrol	trail	\$1,041.00	12	\$12,496			\$0		\$0	\$12,496
Safety, sign installation and repair	each	\$444.00	93	\$41,280			\$0		\$0	\$41,280
Replace/improve drainage structures	miles	\$7,151.00	21	\$145,175			\$0		\$0	\$145,175
<i>Subtotal Road & Trails</i>				<i>\$1,005,334</i>			<i>\$0</i>		<i>\$0</i>	<i>\$1,005,334</i>
D. Structures										
<i>Subtotal Structures</i>				<i>\$0</i>			<i>\$0</i>		<i>\$0</i>	<i>\$0</i>
E. BAER Evaluation										
BAER Team analysis and Plan Preparation	each			\$130,000			\$0		\$0	\$130,000
Engineering Assessments of Slumps and Spillway	hours	\$115.00	200	\$23,000			\$0		\$0	\$23,000
Site Risk Assessments	sites	\$431.08	13	\$5,604			\$0		\$0	\$5,604
Native American Consultation	hours	\$150.00	36	\$5,417						
<i>Subtotal BAER Evaluation</i>				<i>\$164,021</i>			<i>\$0</i>		<i>\$0</i>	<i>\$164,021</i>
F. Monitoring				\$0			\$0		\$0	\$0
Treatment Monitoring	each	\$52,194	1	\$52,194			\$0		\$0	\$52,194
G. Totals				\$4,268,580			\$0		\$0	\$4,268,580

PART VII - APPROVALS

1. _____
Forest Supervisor (signature) _____
Date

2. _____
Regional Forester (signature) _____
Date