

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 DESCRIPTION

- A. Fire Name: Pine Canyon Complex B. Fire Number: NM-CAF-000394
C. State: NM D. County: Rio Arriba
E. Region: 03 Southwestern F. Forest: 02 Carson NF
G. District: 02 El Rito RD
H. Date Fire Started: 09/17/2005 I. Date Fire Contained: 09/23/2005
J. Suppression Cost: \$1,500,000
K. Fire Suppression Damages Repaired with Suppression Funds
 1. Fireline waterbarred (miles): approx. 8 miles
 2. Fireline seeded (miles): 0
 3. Other (identify):
L. Watershed Number: El Rito Creek HUC 1302010207
M. Total Acres Burned: 3,918 acres
 NFS Acres (3,918) Other Federal () State () Private ()
N. Vegetation Types: Ponderosa Pine/ Pinyon Juniper/ sagebrush

O. Dominant Soils:

SOIL TYPE	LSC	SLOPE %
Typic & Mollic Eutroboralfs	5, -1	0 – 40
Typic Haplustalfs	4, +1	15 - 40
Typic Haplustalfs	4, +1	0 - 15

P. Geologic Types:

Ritito Conglomerate (Tr)
El Rito Formation (Te)
Terrace Deposits (Qt)

Q. Miles of Stream Channels by Order or Class:

Stream	Class	Miles
Angel Canyon	ephemeral	6.0
Madera Canyon	ephemeral	1.8
Pine Canyon	ephemeral	2.2
Total Miles		10.0

R. Transportation System

Trails: zero miles Roads: 21.9 miles:

Forest Road	Miles
Angel Canyon	12.0
Madera Canyon	5.6
Pine Canyon	4.3
Total Miles	21.9

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 2,025 (low) 379 (moderate) 1,514 (high)

B. Water-Repellent Soil (acres): 1,893.

C. Soil Erosion Hazard Rating (acres):
0 (low) 3,554 (moderate) 364 (high)

D. Erosion Potential: 5.7 tons/acre

E. Sediment Potential: 2,512 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 5.

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

C. Equivalent Design Recurrence Interval, (years): 25

D. Design Storm Duration, (hours):	<u>1</u>
E. Design Storm Magnitude, (inches):	<u>1.5</u>
F. Design Flow, (cubic feet / second/ square mile):	<u>140</u>
G. Estimated Reduction in Infiltration, (percent):	<u>25</u>
H. Adjusted Design Flow, (cfs per square mile):	<u>175</u>

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

The Pine Canyon Complex is a human caused fire that started September 17, 2005. There were multiple points of origin along FDR 137 on the southern and western edge of the perimeter. The fire grew to approximately 650 acres in the first burning period, follow by an increase in size on September 20, 2005 of approximately 2,500 acres. Fire behavior and rate of spread that occurred during this time period resulted in most of the 1,514 acres high burn severity in the Madera Canyon, Pine Canyon and Angel Canyon watershed areas. The ephemeral streams in these canyon areas are tributaries of the perennial El Rito Creek.

Values at Risk

El Rito Creek watershed, tributary to the Rio Chama (*Source: Delegation of Authority, El Rito Ranger District, item #5 of document dated 09/22/2005*).

Possible sources of degradation to the specified watershed aggravated or accelerated by the effects of the fire:

- Nonpoint source discharges of sediment and ash, above normal background levels that may enter active water channels over time.
- Ash and sediment discharges transported downstream beyond fire boundary due to the water repellant conditions of soils in high and moderate burn severity area and the larger peak flows anticipated due to loss of vegetative canopy and groundcover.
- Debris flows that may affect stabilization of the watershed within the fire boundary for 3 to 5 years within the fire boundary.

Threats to water quality:

Onsite Productivity Values:

- Riparian Habitats: These areas are at risk due to changes in peak flows, which will result in channel erosion and loss of the riparian vegetation component.
- Meadows and Toe slope Grasslands: Increased peak flows in first order and smaller channels will result in increased rates of surface sheet erosion and gully erosion, and consequent drying of the grasslands, resulting in encroachment of ponderosa pine. These grasslands are important to elk herds, deer herds, bears, and small rodents.
- Water Quality: (State of NM 303(d) List for Assessed Stream and River Reaches, 2004 to 2006)
 - El Rito Creek (Village of El Rito to headwaters) is currently attaining all designated uses. Designated uses fully supported are Domestic Water Supply, High Quality Cold Water Fishery, Irrigation, and Wildlife Habitat.

The State of New Mexico has developed a Total Maximum Daily Load (TMDL) management plan for water bodies within the Rio Chama watershed. This plan seeks to protect existing water quality and the designated uses identified for these water bodies.

Offsite productivity values:

The designated uses for all reaches of tributaries of the Rio Chama (San Juan Pueblo to Abiquiu Dam) are "fully supported and not impaired. These uses include irrigation, high quality coldwater fishery, warmwater fishery, livestock watering, wildlife habitat, and secondary contact recreation. Increases in sediment yields, temperatures, and stream bottom deposits resulting from increased erosion, and runoff peak flows will have a negative impact on most of these water uses, but especially the high quality coldwater fishery designation. Since there is approximately 4 and 7 stream miles from Angel Canyon and Pine Canyon respectively between the fire boundary and each specified tributary confluence with El Rito Creek; there is a low chance of impairing water quality or affecting aquatic resources. This plan seeks to protect existing water quality and the designated uses identified for these water bodies.

Loss of long term site productivity:

Increased levels of surface soil erosion and sediment delivery are predicted as an effect of the high and moderate burn severity areas within the Pine Canyon Complex fire area. The expected increased runoff and sediment delivery to the drainage network within the fire area will have a negative effect on existing channel conditions within and downstream of the burn area.

The loss of vegetative canopy cover and protective surface soil litter in pinyon-juniper woodland and Ponderosa pine forest, the development of water repellant conditions of soils in these areas will result in the acceleration of existing erosion processes and poses a threat to long-term soil productivity. These conditions also increase the risk of water quality impacts as sediment is delivered to the ephemeral channels and increases the threat to downstream resources.

Burn severity is a measure of hydrologic response due to loss of vegetative canopy, groundcover and alteration of surface soil/water interactions that are caused by a wildfire. Burn severity classes and acreage of each class observed in the Pine Canyon Complex burned area is summarized as follows:

1,514 acres of high severity (39%),
379 acres of moderate severity (10%), and
2,025 acres of low severity and un-burned (51%).

Threats of invasive plant species:

The increase in surface soil erosion and loss of soil stability also poses a moderate level of threat of introduction and establishment of invasive weed species in these disturbed areas.

The loss of soil stability, potential introduction of invasive plants through use of equipment in suppression activities, the level of land disturbance associated with suppression activities and the increased vulnerability of the burned area poses the threat of introduction and establishment of invasive plant species in newly disturbed areas. Currently, no known populations of invasive species exist in this area. This threat would be addressed by recurrent monitoring of disturbed areas (dozer line, hand line, roads) as well as areas burned at moderate to high burn severity subject to trailing and disturbance from OHV use to detect and treat promptly any new populations that become established.

Threats to cultural resources:

Increased levels of surface soil erosion are predicted as an effect of the high and moderate burn severity areas found between Pine Canyon and Angel Canyon. This increased rate of erosion poses a threat to cultural resource site stability, especially in the west tributaries of the Angel Canyon watershed.

Threats to property:

There is a moderate risk of damage and loss to existing Forest Service infrastructure (roads) and structural drainage facilities (culverts) on FDR 137 downstream of the burned areas in Madera, Angel and Pine Canyons. There is a low risk or threat to private property downstream of National Forest lands below Angel Canyon as a result of increased peak flows. There is also a high risk of damage to FDR 749 in Pine Canyon and 749A in Angel Canyon.

B. Emergency Treatment Objectives:

Protect existing investments in Forest Service and private infrastructure and structural erosion control measures from damage or loss in Madera, Pine and Angel Canyons.

Control sediment delivery and transport in Madera, Pine and Angel Canyons to mitigate effects to water quality downstream of the fire perimeter. Prevent ash and debris flow sediments from reaching perennial waters of El Rito drainage.

Re-establish surface vegetative ground cover on moderate and high burn severity areas to prevent unacceptable rates of surface soil loss, sediment delivery, loss of soil quality, and unacceptable losses of long term site productivity.

Prevent introduction and establishment of invasive plants into the burned area by detecting and treating any new populations that occur from suppression activities, land disturbance from those activities or from loss of existing vegetation and cover due to the fire.

Protect cultural resources between Pine Canyon and Angel Canyon from loss and damage due to increased surface soil erosion and increased peak flows.

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

Land 90 % Channel 80 % Roads 90 % Other 80 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
<u>Land</u>			
Area access closure	100	100	N/A
Grazing modification	100	100	N/A
Aerial Seeding	60	70	80
<u>Channel</u>			
Sediment/ash traps	90	90	90
Directional falling of large woody debris	70	90	100

Angel Canyon check dam	90	90	100
Roads			
Stabilize accessible roads	90	100	100
Other			
Cleanout existing dirt tanks	90	90	90
Construct water spreaders	80	90	100

E. Cost of No-Action (Including Loss): \$371,800

F. Cost of Selected Alternative (Including Loss): \$324,610

G. Skills Represented on Burned-Area Survey Team: (see BAER Roster)

☒ Hydrology ☒ Soils ☐ Geology ☒ Range ☒ Recreation/Lands
☒ Forestry ☒ Wildlife ☐ Fire Mgmt. ☐ Engineering ☐
☐ Contracting ☐ Ecology ☐ Botany ☒ Archaeology ☐
☐ Fisheries ☐ Research ☐ Landscape Arch ☒ GIS

Team Leader: **Greg Miller and George Long (Team Leader Trainee)**

Email: gmliller@fs.fed.us

Phone: (505)758-6251

FAX: (505)758-6213

glong@fs.fed.us

(505)586-0520

(505)586-0521

Pine Canyon Complex Burned Area Emergency Response Damage Assessment Team:

<u>Personnel</u>	<u>Resource Specialty</u>	<u>Personnel</u>	<u>Resource Specialty</u>
Greg Miller	BAER Team Leader Hydrologist/Soil Scientist	Ray Martinez	Recreation/Lands
George Long	BAER Team Leader (Trainee) Roads Evaluation	Michael Kyte	Archaeology
Dave Lawrence	Timber/Silviculture	Jojo Lujan	Wildlife
Jeff Muehleck	GIS Analysis and Support	Craig Newman	Range
Greg Kuyumjian	Hydrologic modeling support		

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:

- **Area access closure**, signing, and placement of barricades to discourage OHV cross-country travel. Estimated timeframes:

- Low burn severity areas – 0 to 1 years.
- Moderate and High burn severity areas – 2 to 3 years.

Implement a temporary OHV closure of the burned area with barricades at major access points and signage to inform local OHV users of this closure. Utilize increased levels of patrol by District

personnel to ensure effectiveness of the closure and provide for protection of aerial seeding treatment from disturbance or damage potentially caused by OHV use until the watershed area has stabilized.

- **Grazing use modifications:** On-going grazing activities should be removed from the area until soils have stabilized with established vegetative and ground cover. This will result in deferment of grazing for 2 to 3 years from the first growing season post fire. This is an administrative action taken to protect resources and allow revegetation and stabilization of the burned area.
- **Aerial Seeding:** Reseed areas of moderate and high burn severity (approx. 1500 acres) with the following seed mix:

<u>Species proposed</u>	<u>percentage</u>
Slender Wheatgrass	55
Cereal Barley	25
Pubescent Wheatgrass	20

Seeding would be accomplished by fixed wing aircraft. Application rate is proposed at 25 to 30 PLS per square foot.

Rationale for use of the proposed seed mix: 1) successful use of a similar seed mix on the Montoya fire (2002), in which similar geology, range of slopes, and rockiness of the soil surface was encountered, 2) cost effectiveness, and 3) availability of seed by commercial sources of supply.

Note: *original seed mix proposed has been altered due to increased cost and/or lack of availability in commercial markets resulting from large scale seed procurement for burned area stabilization in Eastern Great Basin area.*

Proposed timing of seed application: Mid to late November.

- **Invasive plant detection and treatment:** Monitor areas of moderate and high burn severity (approx. 1500 acres) within the burn area to detect new populations of invasive plants resulting from the burn. Promptly plan and implement appropriate treatments of populations detected to prevent further expansion of these species into surrounding disturbed areas.

Channel Treatments:

- **Construct sediment basins** in upper watershed areas of Pine and Angel Canyons where existing head cuts threaten to expand and deepen. Basins will trap and retain sediment and ash from being transported to main channel during periods of runoff from rainfall events.
- **Directional falling of large woody debris (LWD)** in channel at Pine Canyon and Angel Canyon. Stabilize and maintain existing channel sinuosity by dropping large diameter (burned) trees with root wads intact. Lock in place with trenches to provide for areas of sediment deposition and retention while maintaining existing meander pattern of channels and facilitate retaining sediment and ash on site.
- **Repair and maintain the Angel Canyon Check dam** Make necessary repairs to maintain the integrity of the existing loose rock and wire mesh dam below the mouth of Angel Canyon. Use a D6 dozer to uniformly spread ash/debris flows intercepted to the periphery of the check dam during the monsoon season. This treatment may need to be repeated in subsequent years to maintain the effectiveness of this check dam to retain ash/debris flows and to allow for the slow spread and release of water through the check dam.

Roads and Trail Treatments:

- **Stabilize accessible roads** (open roads) with rolling grade dips to prevent surface runoff and erosion damage of road surfaces and grades by intercepted overland flows. Stabilization of existing open roads will prevent overland flows from being captured by the road and contribute toward redistribution (spreading) of overland flows.
- **Storm Patrol (FDR 137)** by District personnel during rain events to keep culverts clear and passable. Monitor levels of sediment accumulation in inside road bar ditch, and advise and schedule ditch cleaning as needed.
- **Additional ditch relief culverts** are proposed on FDR 137 to provide for adequate culvert capacity in areas where high and moderate burn severity has increased runoff from small watershed areas above the road and where the post fire damage assessment notes high probability of road damage from this additional runoff volume.
- **Culvert outlet protection** at existing ditch relief and stream channel crossing culverts where increased runoff is likely to cause erosion and headcutting into FDR 137 as a result. Suitable rock material is available nearby and treatment will entail screening of rock and placement at culvert outlets.
- **Sediment trap construction at CMP 3** is proposed to allow for sediment generated by runoff from the burned area to still and collect to protect and maintain the function of this culvert.

Structures:

- **Cleanout existing dirt tanks** from sediment/ash flows and increase capacities to capture sediment. This will require regular maintenance and movement of retained sediments/ash to locations that will not flow into ephemeral drainages.
- **Construct water spreaders** to intercept sediment/ash/debris flows from entering existing stock tanks and allow sediments/ash/debris to be spread across slopes of 4% or less and away from ephemeral drainages.

I. Monitoring Narrative:

(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.)

- **Monitoring is recommended** in the Pine Canyon Complex burned area for at least 2 years post treatment. Monitoring would occur after major storm runoff events and focus on treatment effectiveness, post storm conditions and storm damage to infrastructure (forest roads, culverts, check dam). The purpose of the monitoring is: 1) to evaluate the effectiveness of treatments implemented in restoring vegetative cover to high and moderate burn severity areas to minimize levels of surface soil erosion and sediment delivery to stream channels, 2) to evaluate the effectiveness of fall aerial seeding in surface soil stabilization of affected cultural resource sites within the burned area and as identified in the cultural resource specialist report, and 3) to evaluate the effectiveness of road protection measures in protecting FDR 137 and other secondary travel routes and their associated drainage structures. A detailed monitoring plan will be submitted as required.

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

			NFS Lands				Other Lands			All	
		Unit	# of	WFSU	Other		# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	SULT \$	\$		units	\$	Units	\$	\$
A. Land Treatments											
aerial seed - fixed wing application	ac	15	1500	\$22,500	\$0			\$0		\$0	\$22,500
seed costs (purchase seed & delivery)	ac	10	1500	\$15,000	\$0			\$0		\$0	\$15,000
OHV signing and area closure	ac	10	700	\$7,000							\$7,000
Invasive weed detect/treatment	ac	10	300	\$3,000							\$3,000
Subtotal Land Treatments				\$47,500	\$0			\$0		\$0	\$47,500
B. Channel Treatments											
Pine - Angel Canyons riparian dir. falling	mi	17500	1.95	\$34,125	\$0			\$0		\$0	\$34,125
Pine Canyon riparian sediment traps	str	1500	4	\$6,000	\$0						\$6,000
Angel Canyon Check dam protection	ac	534	8	\$4,272	\$0						\$4,272
Subtotal Channel Treat.				\$44,397	\$0			\$0		\$0	\$44,397
C. Road and Trails											
Culverts-FDR 137	ea	1000	5	\$5,000	\$0			\$0		\$0	\$5,000
Road storm patrol				\$3,000	\$0			\$0		\$0	\$3,000
Road Culvert spillway protection	str	685	6	\$4,110							\$4,110
Road stabilization	mi	1100	10.5	\$11,550							\$11,550
Sediment trap	str	900	1	\$900	\$0			\$0		\$0	\$900
Subtotal Road & Trails				\$24,560	\$0			\$0		\$0	\$24,560
D. Structures											
stock tank cleaning		1000	4	\$4,000	\$0			\$0		\$0	\$4,000
water spreaders		1000	6	\$6,000	\$0			\$0		\$0	\$6,000
Subtotal Structures				\$10,000	\$0			\$0		\$0	\$10,000
E. BAER Evaluation											
BAER assessment				\$0	\$20,360			\$0		\$0	\$20,360
Subtotal Evaluation				\$0	\$20,360			\$0		\$0	\$20,360
F. Monitoring											
				\$5,000	\$0			\$0		\$0	\$5,000
Subtotal Monitoring				\$5,000	\$0			\$0		\$0	\$5,000
G. Totals				\$131,457	\$20,360			\$0		\$0	\$151,817

PART VII - APPROVALS

1. /s/ Martin D. Chavez October 11, 2005
Forest Supervisor (signature) Date

2. /s/ Abel M. Camarena October 21, 2005
Regional Forester (signature) Date