

PIKE-SAN ISABEL
CANYON
1996

MESSAGE SCAN FOR JERRY FREEOUF

To J.Freeouf:R02A

From: JEFFREY BRUGGINK:R02F12A

Postmark: May 29,96 12:46 PM

Delivered: May 29,96 12:50 PM

Subject: Revised FInal Picketwire

Comments:

Finally, I was able to get on a DG and complete the requested changes to the Picketwire Rehab Report. According to the district the Dropseed may have been mistyped, from .3 to 3 lbs. Anyhow, the Purgatorie river near this burn was 1 foot over flood stage earlier this week. Good thing you were out there with that ATV. I am completely flowing over myself with projects and fire rehab. I anticipate some xtra soil/water funds from MAR targets we will not get at as well as fire salary savings. Anyone up there or on another forest that may want to detail here for 3-4 weeks?

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BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

- ☒ 1. Funding request for estimated EFFF-FW22 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 and design analysis
 ☐ Status of accomplishments to date
☐ 3. Final report - following completion of work

PART II - BURNED-AREA DESCRIPTION

- A. Fire Name: CANYON FIRE B. Fire Number: P25840
C. State: COLORADO D. County: LAS ANIMAS
E. Region: ROCKY MOUNTAIN R-2 F. Forest: PIKE SAN ISABEL ETAL
G. District: COMANCHE
H. Date Fire Started: 03/31/96 I. Date Fire Controlled: 04/04/96
J. Suppression Cost: \$264,800
K. Fire Suppression Damages Repaired with EFFF-PF12 Funds:
 1. Fireline waterbarred (miles) 1.5
 2. Fireline seeded (miles) 0
 3. Other (identify) 1.0 MILES OF FENCE REPAIRED
L. Watershed Number: 1102001053
M. NFS Acres Burned: 6228 Total Acres Burned: 9323
 Ownership type:
 (14%) State () BLM (14%) PVT () 19% ARMY
N. Vegetation Types: COTTONWOOD BOTTOMLANDS, MIXED GRASSES, JUNIPER
O. Dominant Soils: USTIC TORRI FLUVENTS, LITHIC USTIC, TORRI ORTHENTS,
 COARSE LOAMY CALCARIOUS USTIC TORRIFLUVENTS
P. Geologic Types: SEDIMENTARY DAKOTA SANDSTONE (CRETACIOUS), MORRISON
 FORMATION (JURASSIC)
Q. Miles of Stream Channels by Order or Class:
 1st-14.7 2nd-9.8 3rd-6.2 4th-0.3
 PURGATOIRE RIVER IS A 7 ORDER STREAM IN SECTION WHERE FIRE OCCURRED

R. Transportation System:

Trails: 10 miles

Roads: 10 miles

PART III - WATERSHED CONDITION

- A. Fire Intensity (acres): 6000 (low) 2500 (moderate) 800 (high)
- B. Water-Repellent Soil (acres): 0
- C. Soil Erosion Hazard Rating (acres):
4000 (low) 900 (moderate) 4400 (high)
- D. Erosion Potential: 11 tons/acre
- E. Sediment Potential: 5 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period: 5 years
- B. Design Chance of Success: 85 percent
- C. Equivalent Design Recurrence Interval: 10 years
- D. Design Storm Duration: 24 hours
- E. Design Storm Magnitude: 3.2 inches
- F. Design Flow: 1.56 cubic feet per second per square mile
- G. Estimated Reduction in Infiltration: 0 percent
- H. Adjusted Design Flow: 1.56 cubic feet per second per square mile

PART V - SUMMARY OF ANALYSIS

- A. Describe Watershed Emergency:

THIS CANYON CONTAINS NATURAL HIGHLY EROSION CANYON WALLS AND FLUVIAL BOTTOM LANDS. PREFIRE VEGETATION WAS SPARSE IN MANY AREAS DUE TO PAST USE AND CLIMATIC FACTORS. THE FIRE BURNED RELATIVELY FEW AREAS INTENSIVELY. (THE LACK OF VEGETATION AND DEVELOPMENT OF ORGANIC HORIZONS LIMITED THE DEPTH AND INTENSITY OF BURNING.) THIS WATERSHED INCLUDES PALEONTOLOGICAL RESOURCES OF NATIONAL SIGNIFICANCE. RESTORATION RECOMMENDATIONS ARE PRIORITIZED BY THE NEED TO MAINTAIN SOIL AND VEGETATION PRODUCTIVITY SURROUNDING THESE RESOURCES..

- B. Emergency Treatment Objectives:

REESTABLISH VEGETATIVE COMMUNITIES ALONG STREAMBANKS, INTENSIVELY BURNED CANYON WALLS, AND SIGNIFICANT HERITAGE AND PALEONTOLOGICAL RESOURCES. TREATMENTS ARE TO INCLUDE SEEDING, AND FENCING TO LIMIT CATTLE AND PEOPLE FROM AREAS THAT ARE BEING SEEDED OR REHABILITATED.

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

Land 60 % Channel NA % Roads 90 % Other %

D. Probability of Treatment Success

	<----Years after treatment----->		
	1	3	5
Land	60	30	90
Channel/1	50	70	90
Roads	90	90	100
Other /2	60	90	90

/1 Channel treatments include small rock dams at side drainages. Approximately 10 of these will be constructed from existing rock.

/2 PALEONTOLOGICAL-HERITAGE-CULTURAL

E. Cost of No-Action (Including Loss): \$ see A below

A intrinsic value losses: these include historical, cultural, paleontological, ecological and biological. Recreational losses are minimal as they are short term. The potential for losses of current values of the watershed may be increased by degradation of soil and water resources. The current values of the watershed are tied to the landscape qualities provided by the diversity of biological and interpretive opportunities.

F. Cost of Selected Alternative (Including Loss): \$34,088

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"/> Timber	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Research	<input checked="" type="checkbox"/> Archaeology
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____

Team Leader: Chuck Harnish

Phone: 303-275-5105 Electronic Address: R02A

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.

A detailed report of the Canyon Fire area is attached. Please refer to the detailed section for additional information on the significance of the watershed and it's resources.

GENERAL TREATMENT NEEDS

The following treatments have been proposed to mitigate the threat to life property, loss of site productivity, and loss to significant paleontological and cultural resources.

LAND TREATMENT

1. Seeding of high intensity burn area and areas of concern for soil and vegetation losses (approximately 230 acres). This is to include ground broadcast seeding of two general soil types. Each soil type is to have a unique seed mix adapted to the soil characteristics. It is highly recommended to use sand dropseed as one of the species in the seed mixes. This species has a very high seed count per pound, but it has been shown to be one of the best species for reclamation purposes on the sandy soils and dry climate of this part of Colorado. The 2 mixes are given below by soil type

1. Dry sandy fluvial deposits along the bottom river terraces. In many areas all organic matter has been consumed and the threat of wind erosion is high. Annual instantaneous peaks can reach 10 feet above the stream bottom and can affect these terraces. Average annual flows are normally 2-3 feet above the bottom of the stream. This seed mix includes 427 seeds/sq ft or 13 lbs/acre.

Sandy Mix	lbs/acre	seed/sq ft
Annual Ryegrass	3	14
Paloma Indian Ricegrass	4	21
Blackwell Switchgrass	3	27

10 62

District included Sand Dropseed into the sandy mix for diversity needs

2. Sany loam alluvial fans at the base of side canyons. Seeding of these areas is to protect surface wind erosion. These areas are abandoned farm fields that have high calcium carbonate content at the surface. Crusting of the surface is expected with these soils following removal of the organic matter. This mix includes 62 seeds/sq ft at 9 lbs/acre.

Sandy Loam Mix	lbs/acre	seeds/sq ft
Blackwell Switchgrass	3	27
Paloma Indian ricegrass	3	21
Annual Ryegrass	3	14

9 62

The Ranger District is adding 2 additional species through wildlife funds, these are Barton Western Wheat 3 lbs/acre and Blue Grama 3 lbs/acre.

2. Broadcast seeding (approximately 80 acres) adjacent to heritage and paleontological resources that are in danger of soil erosional losses. Grass species will include Blue grama, Side oats Grama and little bluestem at a rate of 78 seeds/sq ft (9 lbs/acre).

	lb/acre	seeds/sq ft
Heritage mix: Blue Grama	3	56
Side Oats Gram	3	13
Little bluestem	3	9
	9	78

3. Temporary fencing of approximately 2 miles to protect seeded as well as critical areas during revegetation from cattle. Over 10 miles of boundary fence is in need of repair. The temporary fencing is to protect critical areas from cattle while permanent fencing can be repaired. This is critical since it is spring green-up time and herbivory and compaction could significantly alter vegetation and soil composition following fire.

PART VI - EMERGENCY REHABILITATION TREATMENTS AND SOURCE OF FUNDS BY LAND OWNERSHIP

Line Items	Units	Unit Cost \$	NFS Lands			Other Lands			All
			Number of Units	EFFS- FW22 \$	Other \$ ident.	Number of Units	Fed \$ NF District ident.	Non-Fed \$ ident.	Total \$
A. LAND TREATMENTS									
seed	lb	3.23	4000	12908			2600		15508
seed application	ac	15	310	4650			1200		5850
mulch includes delivery	ton	118	30	3530					3530
fencing	mile	2000	2	4000			1000		5000
B. CHANNEL TREATMENTS									
C. ROADS AND TRAILS									
D. STRUCTURES									
E. BAER EVALUATION/ ADMINISTRATIVE SUPPORT									
Salary				8000			1500		9500
Travel				1000					1000
F. TOTALS									
				34088			6300		40388

PART VII - APPROVALS

1. /s/ RICK D. CABLES April 08, 1996
Forest Supervisor Date

2. _____
Regional Forester Date

DETAILED INFORMATION OF THE WATERSHED

I. INTRODUCTION.

The Canyon Fire (P25840) was ignited on March 31st, 1996, and was controlled on April 4th. During the duration of the fire, approximately 9300 total acres were burned over including 6471 acres of Forest System land or State of Colorado lands administered by the USDA Forest Service. The Forest System lands constituted most of the Northern Parcel of the Picket Wire Canyonlands, a special management area administered by the Comanche National Grassland. The Picket Wire Canyonlands is a congressionally designated area comprising 11500 acres in and adjacent to the Purgatoire River canyon in southeastern Colorado about 35 miles south of La Junta. In 1990 via Public Law 101-510, the U.S. Congress directed that the land comprising the canyonlands be transferred from the US Department of the Army to the USDA Forest Service. In the transfer legislation, the Congress directed that the Forest Service conserve and protect the unique and highly significant archeological, historical, paleontological and natural resources known to exist in the Canyonlands and to prepare a Management Plan to that end. The Canyonlands are currently managed under a 10C management designation whereby emphasis is on protection and appropriate public use and enjoyment of unusual scenic, historical, geological, botanical, zoological, paleontological, and other natural resources and their special characteristics. In 1993, the Forest Service implemented a lease agreement with the State of Colorado whereby approximately 4500 acres of state land interfingered with the Canyonlands are to be administered by the Forest Service through the same management practices as are applied to the Canyonlands.

Currently, approximately 410 archeological and historic resources have been recorded in the Northern Parcel of the Canyonlands. Two hundred of the recorded resources have been determined significant and eligible to the National Register of Historic Places. Especially noteworthy in this context are:

- the Rourke Ranch, a historic pioneering ranch founded by Eugene Rourke, a prominent local figure; period architecture is preserved at the Ranch.
- the Dolores Mission and Cemetery, a surviving record of early hispanic culture in the canyon. Ornate hand-carved headstone and the ruins of a local Catholic Church are preserved here.
- Prehistoric habitation sites and rock art dating to the Ceramic period or approximately AD 800-1100. These sites contain rich archeological deposits, stone structures and a plethora of rock art, they are believed to be the remains of the Apishipa Culture, a High Plains group with ties to the Southwest. The total amount of rock art may be the most known for Forest Service administered lands.

The Canyonlands also contains a wealth of paleontological resources with Dakota Sandstone and Morrison Formation deposits dating to the Jurassic Period. The most significant paleontological resource is the Purgatoire River Dinosaur Tracksite where over 1300 individual track prints of Jurassic dinosaurs are preserved in Morrison limestones. The tracksite is a priceless scientific and visitor education resource; it is prominently cited in the paleontological literature pertinent to studies of Jurassic fauna. The local geologic strata also contain dinosaur bone and invertebrate fossils dating to the Jurassic, and these locations are currently being mapped.

Recreational visitor opportunities are focussed on the cultural resources and the dinosaur tracksite, and the spectacular natural setting. Few developed amenities are provided, consistent with the semi-primitive ROS setting. A pedestrian/horse/bicycle

trail provided access to the tracksite and toilets are provided at the tracksite and at the Rourke Ranch. Minimal signing to guide the visitor is provided along the trail and cultural resources and the tracksite. Guided four-wheel drive tours to the Rourke Ranch rock art, the Mission and Cemetery, and the tracksite also are provided.

II. FIRE DAMAGE

The fire burned over approximately 6500 acres of Forest Service administered lands including many areas featuring high densities of archeological and historical sites. Of the known 410 cultural resources in the Northern Parcel of the Canyonlands, approximately two-thirds, or 270 sites were burned over. Special efforts were made during the fire-fighting efforts to protect the most significant resources, specifically the Rourke Ranch and the Dolores Mission and Cemetery, and these efforts were largely successful. However, some damage did occur. No fire suppression damage is known, as the archeologists assigned to the fire were able to implement avoidance measures. The Dinosaur Tracksite was also successfully protected. The following is a detailed description of known damage.

A. Archeological (prehistoric) resources. The fire burned over many of the large prehistoric Apishipa sites that contain structures, large archeological deposits and rock art. A survey of these sites revealed no measurable damage. Soils were generally not affected or only affected to a depth of 1-2 inches. Where juniper trees burned, soils were burned a few inches deeper. No damage to structures was observed. No damage to rock art was observed; however, some spalling of the faces of sandstone boulders was observed where consumed juniper trees were close to the rock face, so it is possible some damage sites not visited during the survey did occur.

B. Historical resources. Measurable damage did occur, primarily to the wooden component at these sites. The specific instances are as follows:

Rourke Ranch Calving Shed (5LA6533). The fire burned approximately 350 feet of stockade south of the calving shed. The stockade functioned to corral stock at the shed.

Rourke Ranch Complex proper (5LA5826). The fire burned over the stockpile bone yard east of the barn and stable, destroying a wooden stock trough, stockpiled fencepost and milled lumber and scrap stored in this location for possible salvage. The fire destroyed approximately 100 feet of fence and also burned the historic dump.

Minnie Canyon Corral (5LA6345). The fire completely destroyed the corral; archeological deposits here survived.

Dolores Mission and Cemetery (5LA5844). The fire burned approximately 100 feet of fence along the south and east sides; the church and headstone area was protected. Across the road, the fire burned some of the wooden support structure (approximately 15 fallen beams and standing vertical poles) for the associated barn/stable).

Damacio Lopez Homestead/Frost Ranch (5LA5842). The fire consumed most wood remains at this site, including virtually all structural beams and posts (estimate 50-100 total).

C. Paleontological resources. The dinosaur tracksite was not burned over. Damage to paleontological deposits is estimated to be minimal because the fossil-bearing strata were not much affected by the fire.

D. Recreation improvements. No improvements were affected. There is a possible

beneficial effect because the fire and the subsequent succession and recovery can be interpreted.

E. Soil and Vegetation Resources. Field surveys of the fire intensity showed minimal damage to the soil surfaces horizons. In most areas residual organic matter was more than 30% of pre-burn conditions. The potential losses will generally be tied to future climatic patterns and storm intensity. The greatest erosion potential and sediment transport may occur along streambanks of intensively burned tamarisk and cottonwood. Any flooding in the next few months may cause some sediment to move due to the loose sandy deposits found along the bottom floodplain terraces. The other areas of concern include some of the abandoned fields and greasewood flats. These areas had a pre-burn condition of hard crusted surface soil, probably due to high calcium content and past management use. Regeneration is limited due to poor aeration and moisture storage. These areas have little residual organic matter cover and therefore cannot hold moisture when it occurs. Disking and seeding are recommended. The canyon walls have the greatest inherent erosion potential. However, we did not observe any fire intensities on these soils that is of emergency rehab needs. Many areas where the organic matter seems to be completely consumed in the soil surface had very little pre burn material. This include some of the bare sandy terraces that did not have any woody species or grass cover. These areas will come back very strong to early seral species including many of the "weed" species as identified in the canyon floodplain.

The mesa tops, which include juniper-blue grama associations, appeared to burn with low to moderate intensity. Many areas were observed where only the sod forming grasses were burned and the flames did not reach into the juniper scattered throughout the unit. Concerns are limited to small acreages on the mesa tops.

Potential losses of soil and vegetative resources will be increased if cattle are not kept off of naturally regenerating vegetation and any seeding that may be done along the floodplain terraces. We notice cattle already on the burn two days after been determined controlled.

III. POST BURNING THREATS TO RESOURCES.

For specifically the archeological, historical, and paleontological resources, the threats are predicted to emanate from three sources: increased erosion, greater flood severity, and increased visitor use, damage, and vandalism. Specific threats are described as follows:

A. Archeological resources. Most prehistoric sites that were burned over are located on the talus or on side slopes. Many have undulating topography with small drainages. Because of the lost of vegetation, water erosion along and at the heads of these drainages is a threat. Loss of vegetation has also rendered the location of archeological sites more obvious and bared the surface, thereby increasing the possibility of surface collection of artifacts. Without action, there will be a quantifiable loss of archeological deposits due to erosion, and loss of surface artifacts and information due to increase in illegal collection.

B. Historical resources. Most historic sites are in the canyon bottom.

Erosion of deposits is less of a threat, but still present. The loss of surface cover has exposed significant quantities of historical items, more so than at prehistoric sites. Loss of fencing at the Dolores Mission and Cemetery will result in greater impacts to the headstone area by visitors and by trespass stock. Loss of ground cover and structural wood at the Damascio Lopez Homestead threatens the structural stability of the standing adobe walls. Without action, there will be a structural loss at the Lopez homestead and greater deterioration at the Dolores Mission. There will also be increased loss of surface artifacts and information from illegal collection.

IV. RECOMMENDATIONS.

The following are the specific treatments recommended to recover the loss caused by the fire and mitigate the immediate post-fire threats to the resource.

A. Archeological (prehistoric resources). No fire-caused damage was noted during the rehabilitation survey, and no archeological recovery measures are recommended. To deter erosion, seeding of some of the archeological areas is recommended; this includes a total of 230 acres in seven separate locations (map provided):

SW 1/4 of Section 4 - 20 acres

NE 1/4 of Sec. 24 and NW 1/4 of Sec. 19 - 40 acres

SE 1/4 of Sec. 7 and SW 1/4 of Sec. 8 - 35 acres

NE 1/4 of Sec. 8 - 40 acres

SW and NW 1/4s of Sec. 4 - 40 acres

NW and NE 1/4s of Sec. 4 - 30 acres

NE 1/4 of Sec. 4 and NW 1/4 of Sec. 3 - 25 acres

TOTAL - 230 acres

In addition, it is recommended that approximately 10 rock water dams, per minor drainage, be located to minimize channelization and headcutting. There are approximately 10 drainages that need this treatment.

B. Historical resources. Archeological recovery and repair/stabilization are recommended at several of the historical sites:

The Calving Shed (5LA6533):

Controlled collection of surface artifacts - COST: \$750

Repair of stockade - COST: \$3000

Damacio Lopez Homestead (5LA5842):

Controlled collection of surface artifacts - COST: \$2000

Stabilization of standing adobe walls - COST: \$7500

Also, it is recommended that fencing damaged by the fire be repaired/replaced at the Rourke Ranch, and CRITICALLY, at the DOLORES Mission and Cemetery. Screening vegetation should be provided at the Dolores Mission and the Damacio Lopez Homestead/Frost Ranch.

Repair fencing at Rourke Ranch (50 feet) - COST:

Repair fencing at Dolores Mission (100 feet - COST:

Install screening vegetation at Dolores Mission and Lopez Homestead (20 juniper and 20 cholla) - COST:

C. Paleontological resources. In regards to the tracksite, the survey did not reveal any increase in fallen debris originating from burned cottonwood or tamarisk; in fact, most fallen limbs and trunks were completely consumed. Thus, an increase in debris causing diversion of river flows does not seem to be a threat. Stream structures in the vicinity of the tracksite and/or hardening of the limestone strata bearing the tracks is recommended as a long term project for the Ranger District.

D. Soil and Vegetation Resources. Approximately 310 acres has been recommended for seeding. This includes seeding of high intensity burned streambanks, poor soil condition abandoned fields and some canyon toeslopes. The seed mix emphasizes native species for reclamation of the canyon. All cat lines will be seeded by the Ranger District if they are not completed by the FFF funds with onsite crews. These are located on the south end of the burn.

Several vegetation photo points were taken and it is recommend that these be taken again 2-3 weeks following the control of the fire and again 3 months following fire. Additional rehab needs can be determined at these times.

The forest should immediately develop a list of opportunities for soil and vegetation enhancement, if any, with the window of opportunity that currently exists. Many species will be suppressed following the fire for a short period of time and goals of increasing or decreasing species composition or diversity will be easier to accomplish at this time. This fire can also be used to show the potential effects of a prescribed fire in similar vegetative and soil types. Long term vegetative changes and soil movement permanent plots could be established. This would provide information for future burn plans to meet specific management goals.

MESSAGE SCAN FOR JERRY FREEOUF

To C.Harnish:R02A
To J.Freeouf:R02A
CC T.Sullivan:R02A

From: JEFFREY BRUGGINK:R02F12A

Postmark: Apr 24,96 2:15 PM

Delivered: Apr 24,96 2:15 PM

Status: Previously read

Subject: Canyon Fire

Comments:

Revised Initial Request for funding of Canyon fire. Final Acres
dropped, requested cost dropped from \$73M to \$34M.

-----X-----

Date of Report: April 4, 1996BURNED-AREA REPORT
(Reference FSH 2509.13)PART I - TYPE OF REQUEST

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 ☐ Status of accomplishments to date
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K. Fire Suppression Damages Repaired with EFFF-PF12 Funds:

1. Fireline waterbarred (miles) 1.5
2. Fireline seeded (miles) 0
3. Other (identify) 1.0 MILES OF FENCE REPAIRED

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(14%) State () BLM (14%) PVT () 19% ARMYN. Vegetation Types: COTTONWOOD BOTTOMLANDS, MIXED GRASSES, JUNIPERO. Dominant Soils: USTIC TORRI FLUVENTS, LITHIC USTIC, TORRI ORTHENTS, COARSE LOAMY CALCARIOUS USTIC TORRIFLUVENTSP. Geologic Types: SEDIMENTARY DAKOTA SANDSTONE (CRETACIOUS), MORRISON FORMATION (JURASSIC)

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Land 60 % Channel NA % Roads 90 % Other %

D. Probability of Treatment Success

	<----Years after treatment----->		
	1	3	5
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Other 1/	60	90	90

← Review

1/ PALEONTOLOGICAL-HERITAGE-CULTURAL

E. Cost of No-Action (Including Loss): \$ see A below

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<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Research	<input checked="" type="checkbox"/> Archaeology
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____

Team Leader: Chuck Harnish

Phone: 303-275-5105 Electronic Address: R02A

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Sandy Mix	lbs/acre	seed/sq ft
Annual Ryegrass	3	14
Paloma Indian Ricegrass	4	21
Sand Dropseed	<u>3</u>	<u>365</u>
Blackwell Switchgrass	3	27
	13	<u>427</u>

2. Sandy loam alluvial fans at the base of side canyons. Seeding of these areas is to protect surface wind erosion. These areas are abandoned farm fields that have high calcium carbonate content at the surface. Crusting of the surface is expected with these soils following removal of the organic matter. This mix includes 62 seeds/sq ft at 9 lbs/acre.

Sandy Loam Mix	lbs/acre	seeds/sq ft
Blackwell Switchgrass	3	27
Paloma Indian ricegrass	3	21
Annual Ryegrass	3	14
	9	62

The Ranger District is adding 2 additional species through wildlife funds, these are Barton Western Wheat 3 lbs/acre and Blue Grama 3 lbs/acre.

2. Broadcast seeding (approximately 80 acres) adjacent to heritage and paleontological resources that are in danger of soil erosional losses. Grass species will include Blue grama, Side oats Grama and little bluestem at a rate of 78 seeds/sq ft (9 lbs/acre).

	lb/acre	seeds/sq ft
Heritage mix: Blue Grama	3	56
Side Oats Gram	3	13
Little bluestem	<u>3</u>	<u>9</u>
	9	78

3. Temporary fencing of approximately 2 miles to protect seeded as well as critical areas during revegetation from cattle. Over 10 miles of boundary fence is in need of repair. The temporary fencing is to protect critical areas from cattle while permanent fencing can be repaired. This is critical since it is spring green-up time and herbivory and compaction could significantly alter vegetation and soil composition following fire.

PART VI - EMERGENCY REHABILITATION TREATMENTS AND SOURCE OF FUNDS BY LAND OWNERSHIP

Line Items	Units	Unit Cost \$	NFS Lands			Other Lands			All Total \$
			Number of Units	EFFS- FW22 \$	Other \$ ident.	Number of Units	Fed \$ ident.	Non-Fed \$ ident.	
A. LAND TREATMENTS <i>Included District by forest \$</i>									
seed	lb	3.23	4000	12908					12908
seed application	ac	15	310	4650					4650
mulch includes delivery	ton	118	30	3530					3530
fencing	mile	2000	2	4000					4000
B. CHANNEL TREATMENTS									
C. ROADS AND TRAILS									
D. STRUCTURES									
E. BAER EVALUATION/ ADMINISTRATIVE SUPPORT									
Salary				8000					8000
Travel				1000					1000
F. TOTALS				34088					34088

PART VII - APPROVALS

1.	<u>/s/ RICK D. CABLES</u> Forest Supervisor	<u>April 08, 1996</u> Date
2.	 Regional Forester	 Date

DETAILED INFORMATION OF THE WATERSHED

I. INTRODUCTION.

The Canyon Fire (P25840) was ignited on March 31st, 1996, and was controlled on April 4th. During the duration of the fire, approximately 9300 total acres were burned over including 6471 acres of Forest System land or State of Colorado lands administered by the USDA Forest Service. The Forest System lands constituted most of the Northern Parcel of the Picket Wire Canyonlands, a special management area administered by the Comanche National Grassland. The Picket Wire Canyonlands is a congressionally designated area comprising 11500 acres in and adjacent to the Purgatoire River canyon in southeastern Colorado about 35 miles south of La Junta. In 1990 via Public Law 101-510, the U.S. Congress directed that the land comprising the canyonlands be transferred from the US Department of the Army to the USDA Forest Service. In the transfer legislation, the Congress directed that the Forest Service conserve and protect the unique and highly significant archeological, historical, paleontological and natural resources known to exist in the Canyonlands and to prepare a Management Plan to that end. The Canyonlands are currently managed under a 10C management designation whereby emphasis is on protection and appropriate public use and enjoyment of unusual scenic, historical, geological, botanical, zoological, paleontological, and other natural resources and their special characteristics. In 1993, the Forest Service implemented a lease agreement with the State of Colorado whereby approximately 4500 acres of state land interfingered with the Canyonlands are to be administered by the Forest Service through the same management practices as are applied to the Canyonlands.

Currently, approximately 410 archeological and historic resources have been recorded in the Northern Parcel of the Canyonlands. Two hundred of the recorded resources have been determined significant and eligible to the National Register of Historic Places. Especially noteworthy in this context are:

- the Rourke Ranch, a historic pioneering ranch founded by Eugene Rourke, a prominent local figure; period architecture is preserved at the Ranch.
- the Dolores Mission and Cemetery, a surviving record of early hispanic culture in the canyon. Ornate hand-carved headstone and the ruins of a local Catholic Church are preserved here.
- Prehistoric habitation sites and rock art dating to the Ceramic period or approximately AD 800-1100. These sites contain rich archeological deposits, stone structures and a plethora of rock art, they are believed to be the remains of the Apishipa Culture, a High Plains group with ties to the Southwest. The total amount of rock art may be the most known for Forest Service administered lands.

The Canyonlands also contains a wealth of paleontological resources with Dakota Sandstone and Morrison Formation deposits dating to the Jurassic Period. The most significant paleontological resource is the Purgatoire River Dinosaur Tracksite where over 1300 individual track prints of Jurassic dinosaurs are preserved in Morrison limestones. The tracksite is a priceless scientific and visitor education resource; it is prominently cited in the paleontological literature pertinent to studies of Jurassic fauna. The local geologic strata also contain dinosaur bone and invertebrate fossils dating to the Jurassic, and these locations are currently being mapped.

Recreational visitor opportunities are focussed on the cultural resources and the dinosaur tracksite, and the spectacular natural setting. Few developed amenities are provided, consistent with the semi-primitive ROS setting. A pedestrian/horse/bicycle

trail provided access to the tracksite and toilets are provided at the tracksite and at the Rourke Ranch. Minimal signing to guide the visitor is provided along the trail and cultural resources and the tracksite. Guided four-wheel drive tours to the Rourke Ranch rock art, the Mission and Cemetery, and the tracksite also are provided.

II. FIRE DAMAGE

The fire burned over approximately 6500 acres of Forest Service administered lands including many areas featuring high densities of archeological and historical sites. Of the known 410 cultural resources in the Northern Parcel of the Canyonlands, approximately two-thirds, or 270 sites were burned over. Special efforts were made during the fire-fighting efforts to protect the most significant resources, specifically the Rourke Ranch and the Dolores Mission and Cemetery, and these efforts were largely successful. However, some damage did occur. No fire suppression damage is known, as the archeologists assigned to the fire were able to implement avoidance measures. The Dinosaur Tracksite was also successfully protected. The following is a detailed description of known damage.

A. Archeological (prehistoric) resources. The fire burned over many of the large prehistoric Apishipa sites that contain structures, large archeological deposits and rock art. A survey of these sites revealed no measurable damage. Soils were generally not affected or only affected to a depth of 1-2 inches. Where juniper trees burned, soils were burned a few inches deeper. No damage to structures was observed. No damage to rock art was observed; however, some spalling of the faces of sandstone boulders was observed where consumed juniper trees were close to the rock face, so it is possible some damage sites not visited during the survey did occur.

B. Historical resources. Measurable damage did occur, primarily to the wooden component at these sites. The specific instances are as follows:

Rourke Ranch Calving Shed (5LA6533). The fire burned approximately 350 feet of stockade south of the calving shed. The stockade functioned to corral stock at the shed.

Rourke Ranch Complex proper (5LA5826). The fire burned over the stockpile bone yard east of the barn and stable, destroying a wooden stock trough, stockpiled fencepost and milled lumber and scrap stored in this location for possible salvage. The fire destroyed approximately 100 feet of fence and also burned the historic dump.

Minnie Canyon Corral (5LA6345). The fire completely destroyed the corral; archeological deposits here survived.

Dolores Mission and Cemetery (5LA5844). The fire burned approximately 100 feet of fence along the south and east sides; the church and headstone area was protected. Across the road, the fire burned some of the wooden support structure (approximately 15 fallen beams and standing vertical poles) for the associated barn/stable).

Damacio Lopez Homestead/Frost Ranch (5LA5842). The fire consumed most wood remains at this site, including virtually all structural beams and posts (estimate 50-100 total).

C. Paleontological resources. The dinosaur tracksite was not burned over. Damage to paleontological deposits is estimated to be minimal because the fossil-bearing strata were not much affected by the fire.

D. Recreation improvements. No improvements were affected. There is a possible

beneficial effect because the fire and the subsequent succession and recovery can be interpreted.

E. Soil and Vegetation Resources. Field surveys of the fire intensity showed minimal damage to the soil surfaces horizons. In most areas residual organic matter was more than 30% of pre-burn conditions. The potential losses will generally be tied to future climatic patterns and storm intensity. The greatest erosion potential and sediment transport may occur along streambanks of intensively burned tamarisk and cottonwood. Any flooding in the next few months may cause some sediment to move due to the loose sandy deposits found along the bottom floodplain terraces. The other areas of concern include some of the abandoned fields and greasewood flats. These areas had a pre-burn condition of hard crusted surface soil, probably due to high calcium content and past management use. Regeneration is limited due to poor aeration and moisture storage. These areas have little residual organic matter cover and therefore cannot hold moisture when it occurs. Disking and seeding are recommended. The canyon walls have the greatest inherent erosion potential. However, we did not observe any fire intensities on these soils that is of emergency rehab needs. Many areas where the organic matter seems to be completely consumed in the soil surface had very little pre burn material. This include some of the bare sandy terraces that did not have any woody species or grass cover. These areas will come back very strong to early seral species including many of the "weed" species as identified in the canyon floodplain.

The mesa tops, which include juniper-blue grama associations, appeared to burn with low to moderate intensity. Many areas were observed where only the sod forming grasses were burned and the flames did not reach into the juniper scattered throughout the unit. Concerns are limited to small acreages on the mesa tops.

Potential losses of soil and vegetative resources will be increased if cattle are not kept off of naturally regenerating vegetation and any seeding that may be done along the floodplain terraces. We notice cattle already on the burn two days after been determined controlled.

III. POST BURNING THREATS TO RESOURCES.

For specifically the archeological, historical, and paleontological resources, the threats are predicted to eminate from three sources: increased erosion, greater flood severity, and increased visitor use, damage, and vandalism. Specific threats are described as follows:

A. Archeological resources. Most prehistoric sites that were burned over are located on the talus or on side slopes. Many have undulating topography with small drainages. Because of the lost of vegetation, water erosion along and at the heads of these drainages is a threat. Loss of vegetation has also rendered the location of archeological sites more obvious and bared the surface, thereby increasing the possibility of surface collection of artifacts. Without action, there will be a quantifiable loss of archeological deposits due to erosion, and loss of surface artifacts and information due to increase in illegal collection.

B. Historical resources. Most historic sites are in the canyon bottom.

Erosion of deposits is less of a threat, but still present. The loss of surface cover has exposed significant quantities of historical items, more so than at prehistoric sites. Loss of fencing at the Dolores Mission and Cemetery will result in greater impacts to the headstone area by visitors and by trespass stock. Loss of ground cover and structural wood at the Damascio Lopez Homestead threatens the structural stability of the standing adobe walls. Without action, there will be a structural loss at the Lopez homestead and greater deterioration at the Dolores Mission. There will also be increased loss of surface artifacts and information from illegal collection.

IV. RECOMMENDATIONS.

The following are the specific treatments recommended to recover the loss caused by the fire and mitigate the immediate post-fire threats to the resource.

A. Archeological (prehistoric resources). No fire-caused damage was noted during the rehabilitation survey, and no archeological recovery measures are recommended. To deter erosion, seeding of some of the archeological areas is recommended; this includes a total of 230 acres in seven separate locations (map provided):

SW 1/4 of Section 4 - 20 acres

NE 1/4 of Sec. 24 and NW 1/4 of Sec. 19 - 40 acres

SE 1/4 of Sec. 7 and SW 1/4 of Sec. 8 - 35 acres

NE 1/4 of Sec. 8 - 40 acres

SW and NW 1/4s of Sec. 4 - 40 acres

NW and NE 1/4s of Sec. 4 - 30 acres

NE 1/4 of Sec. 4 and NW 1/4 of Sec. 3 - 25 acres

TOTAL - 230 acres

In addition, it is recommended that approximately 10 hay bales or rock water dams per minor drainage be located to minimize channelization and headcutting. There are approximately 10 drainages that need this treatment.

TOTAL 100 bales

B. Historical resources. Archeological recovery and repair/stabilization are recommended at several of the historical sites:

The Calving Shed (5LA6533):

Controlled collection of surface artifacts - COST: \$750

Repair of stockade - COST: \$3000

Damacio Lopez Homestead (5LA5842):

Controlled collection of surface artifacts - COST: \$2000

Stabilization of standing adobe walls - COST: \$7500

Also, it is recommended that fencing damaged by the fire be repaired/replaced at the Rourke Ranch, and CRITICALLY, at the DOLORES Mission and Cemetery. Screening vegetation should be provided at the Dolores Mission and the Damacio Lopez Homestead/Frost Ranch.

Repair fencing at Rourke Ranch (50 feet) - COST:

Repair fencing at Dolores Mission (100 feet - COST:

Install screening vegetation at Dolores Mission and Lopez Homestead (20 juniper and 20 cholla) - COST:

C. Paleontological resources. In regards to the tracksite, the survey did not reveal any increase in fallen debris originating from burned cottonwood or tamarisk; in fact, most fallen limbs and trunks were completely consumed. Thus, an increase in debris causing diversion of river flows does not seem to be a threat. Increase in the severity of flood events needs to be calculated and monitored. If this threat is real, in stream structures in the vicinity of the tracksite and/or hardening of the limestone strata bearing the tracks is recommended.

not
consider

D. Soil and Vegetation Resources. Approximately 310 acres has been recommended for seeding. This includes seeding of high intensity burned streambanks, poor soil condition abandoned fields and some canyon toeslopes. The seed mix emphasizes native species for reclamation as well as enhancement of the biological communities of the canyon. All cat lines should be seeded if they are not completed by the FFF funds with onsite crews. These are located on the south end of the burn.

W

Several vegetation photo points were taken and it is recommend that these by taken again 2-3 weeks following the control of the fire and again 3 months following fire. Additional rehab needs can be determined at these times.

The forest should immediately develop a list of opportunities for soil and vegetation enhancement, if any, with the window of opportunity that currently exists. Many species will be suppressed following the fire for a short period of time and goals of increasing or decreasing species composition or diversity will be easier to accomplish at this time. This fire can also be used to show the potential effects of a prescribed fire in similar vegetative and soil types. Long term vegetative changes and soil movement permanent plots could be established. This would provide information for future burn plans to meet specific management goals.

MESSAGE SCAN FOR JERRY FREEOUF

To J.Freeouf:R02A
CC C.Harnish:R02A
CC D.Pieper:R02F12D06A

From: JEFFREY BRUGGINK:R02F12A

Postmark: Feb 10,97 3:40 PM

Delivered: Feb 10,97 3:44 PM

Subject: Final Canyon Report

Comments:

Jerry, enclosed final Canyon Fire report. Signed hard copy is in the mail. When I have time I will get at Buff. Creek 1 and 2. Buff. Ck. 3 will be done in the fall or next winter.

-----X-----

United States
Department of
Agriculture

Forest
Service

Pike and San Isabel
National Forests
Comanche and Cimarron
National Grasslands

1920 Valley Dr.
Pueblo, CO
81008-1797
(719) 545-8737

File Code: 2500-8

Date: February 10, 1997

To: Jerry Freeouf BAER Coordinator Region 2

Re: Canyon Fire, Comanche National Grasslands

Enclosed please find the final 2500-8 report for the Canyon Fire that occurred near LaJunta, Colorado in April of 1996. The BAER Team Leader was Mr. Chuck Harnish, Denver, CO, and the Implementation Team Leader was Mr. Jeff Bruggink, Pueblo, CO. The initial request and approval for BAER funding included seeding, temporary fencing and channel check dams for a total of \$74,000. The implementation of the rehab efforts included a reduced number of acres for seeding and check dams as shown in the enclosed report. The actual costs to the rehabilitation included \$35,600 of BAER funds and an additional \$5700 of soil, water and wildlife funds of the Forests and Grasslands.

Treatments were partially successful. Loss of seed due to wind erosion occurred over much of the area and competition from annual forbs prevented many grass species from being established in the first year. Areas that received a 2-4 ton/acre mulch were successful at establishing the emergency seed. Many areas that were seeded, as well as areas that were not seeded, had a significant growth of species such as kochia, Russian thistle, sunflower, and goosefoot. Due to the growth of these annual plants, the fuel loads one year after the fire are actually higher than the pre-fire conditions. Emergency treatments in these ecosystem types need to consider longer term rehabilitation needs. Future treatments should consider additional mulching or use of matting to control annual species growth through shading and protect seeded areas from seed loss. Other treatments such as mowing or the use of cattle should also be tried to control the growth of annual forbs that provide little in the form of soil protection. The emergency seed generally takes several months or longer to establish a protective cover. During this time, most of the erosional damage occurs and many of the non-desired annual species have become established. Future rehabilitation of fires on similar ecosystem types should consider treatments that control the amount and type of regrowth through the growing season(s).

/s/JEFFREY L. BRUGGINK
Jeffrey L. Bruggink
Forest Soil Scientist

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

- ☐ 1. Funding request for estimated EFFF-FW22 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 and design analysis
 ☐ Status of accomplishments to date
☒ 3. Final report - following completion of work

PART II - BURNED-AREA DESCRIPTION

- A. Fire Name: CANYON FIRE B. Fire Number: P25840
C. State: COLORADO D. County: LAS ANIMAS
E. Region: ROCKY MOUNTAIN R-2 F. Forest: PIKE SAN ISABEL ETAL
G. District: COMANCHE
H. Date Fire Started: 03/31/96 I. Date Fire Controlled: 04/04/96
J. Suppression Cost: \$264,800
K. Fire Suppression Damages Repaired with EFFF-PF12 Funds:
 1. Fireline waterbarred (miles) 1.5
 2. Fireline seeded (miles) 0
 3. Other (identify) 1.0 MILES OF FENCE REPAIRED
L. Watershed Number: 1102001053
M. NFS Acres Burned: 6228 Total Acres Burned: 9323
 Ownership type:
 (14%) State () BLM (14%) PVT () 19% ARMY
N. Vegetation Types: COTTONWOOD BOTTOMLANDS, MIXED GRASSES, JUNIPER
O. Dominant Soils: USTIC TORRI FLUVENTS, LITHIC USTIC, TORRI ORTHENTS,
 COARSE LOAMY CALCARIOUS USTIC TORRIFLUVENTS
P. Geologic Types: SEDIMENTARY DAKOTA SANDSTONE (CRETACIOUS), MORRISON
 FORMATION (JURASSIC)
Q. Miles of Stream Channels by Order or Class:
 1st-14.7 2nd-9.8 3rd-6.2 4th-0.3
 PURGATOIRE RIVER IS A 7 ORDER STREAM IN SECTION WHERE FIRE OCCURRED
R. Transportation System:

Trails: 10 miles

Roads: 10 miles

PART III - WATERSHED CONDITION

- A. Fire Intensity (acres): 6000 (low) 2500 (moderate) 800 (high)
- B. Water-Repellent Soil (acres): 0
- C. Soil Erosion Hazard Rating (acres):
4000 (low) 900 (moderate) 4400 (high)
- D. Erosion Potential: 11 tons/acre
- E. Sediment Potential: 5 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period: 5 years
- B. Design Chance of Success: 85 percent
- C. Equivalent Design Recurrence Interval: 10 years
- D. Design Storm Duration: 24 hours
- E. Design Storm Magnitude: 3.2 inches
- F. Design Flow: 1.56 cubic feet per second per square mile
- G. Estimated Reduction in Infiltration: 0 percent
- H. Adjusted Design Flow: 1.56 cubic feet per second per square mile

PART V - SUMMARY OF ANALYSIS

- A. Describe Watershed Emergency:

THIS CANYON CONTAINS NATURAL HIGHLY EROSION CANYON WALLS AND FLUVIAL BOTTOM LANDS. PREFIRE VEGETATION WAS SPARSE IN MANY AREAS DUE TO PAST USE AND CLIMATIC FACTORS. THE FIRE BURNED RELATIVELY FEW AREAS INTENSIVELY. (THE LACK OF VEGETATION AND DEVELOPMENT OF ORGANIC HORIZONS LIMITED THE DEPTH AND INTENSITY OF BURNING.) THIS WATERSHED INCLUDES PALEONTOLOGICAL RESOURCES OF NATIONAL SIGNIFICANCE. RESTORATION RECOMMENDATIONS ARE PRIORITIZED BY THE NEED TO MAINTAIN SOIL AND VEGETATION PRODUCTIVITY SURROUNDING THESE RESOURCES..

- B. Emergency Treatment Objectives:

REESTABLISH VEGETATIVE COMMUNITIES ALONG STREAMBANKS, INTENSIVELY BURNED CANYON WALLS, AND SIGNIFICANT HERITAGE AND PALEONTOLOGICAL RESOURCES. TREATMENTS INCLUDED SEEDING, AND FENCEING TO LIMIT CATTLE AND PEOPLE FROM AREAS THAT ARE BEING SEEDED OR REHABILITATED.

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

Land 60 % Channel NA % Roads 90 % Other %

D. Probability of Treatment Success

	<----Years after treatment----->		
	1	3	5
Land	60	30	90
Channel/1	50	70	90
Roads	90	90	100
Other /2	60	90	90

/1 Channel treatments include small rock dams at side drainages. Approximately 10 of these were to be constructed from existing rock. A total of 7 small rock dissipators were installed by hand crews. These were to slow the flow of water adjacent and over the main access road.

/2 PALEONTOLOGICAL-HERITAGE-CULTURAL

E. Cost of No-Action (Including Loss): \$ see A below

A intrinsic value losses: these include historical, cultural, paleontological, ecological and biological. Recreational losses are minimal as they are short term. The potential for losses of current values of the watershed may be increased by degradation of soil and water resources. The current values of the watershed are tied to the landscape qualities provided by the diversity of biological and interpretive opportunities.

F. Cost of Selected Alternative (Including Loss): \$35,565

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"/> Timber	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Research	<input checked="" type="checkbox"/> Archaeology
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____

Team Leader: Chuck Harnish

Phone: 303-275-5105

Electronic Address: R02A

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.

A detailed report of the Canyon Fire area is attached. Please refer to the detailed section for additional information on the significance of the watershed and its resources.

GENERAL TREATMENT NEEDS

The following treatments have been implemented to mitigate the threat to life property, loss of site productivity, and loss to significant paleontological and cultural resources.

LAND TREATMENT

PART VI - EMERGENCY REHABILITATION TREATMENTS AND SOURCE OF FUNDS BY LAND OWNERSHIP

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			Number of Units	EFFS- FW22 \$	Other \$ ident.	Number of Units	Fed \$ NF District ident.	Non-Fed \$ ident.	
A. LAND TREATMENTS									
seed	lb	4.23	3000	9690			3000		12690
seed application/mulch	ac	44	250	11000			1200		12200
mulch includes delivery	ton	118	30	3530					3530
fencing	mile	2000	.5	1000					1000
B. CHANNEL TREATMENTS									
Rock Barriers	ea	200	7	1400					1400
C. ROADS AND TRAILS									
D. STRUCTURES									
E. BAER EVALUATION/ ADMINISTRATIVE SUPPORT									
Salary				8000			1500		9500
Travel				1000					1000
F. TOTALS				35620			5700		41320

PART VII - APPROVALS

1. /s/ RICK D. CABLES _____ Date _____
 Forest Supervisor

2. _____ Date _____
 Regional Forester

INITIAL REPORT AND RECOMMENDATIONS

DETAILED INFORMATION OF THE WATERSHED

I. INTRODUCTION.

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Currently, approximately 410 archeological and historic resources have been recorded in the Northern Parcel of the Canyonlands. Two hundred of the recorded resources have been determined significant and eligible to the National Register of Historic Places. Especially noteworthy in this context are:

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- the Dolores Mission and Cemetery, a surviving record of early hispanic culture in the canyon. Ornate hand-carved headstone and the ruins of a local Catholic Church are preserved here.
- Prehistoric habitation sites and rock art dating to the Ceramic period or approximately AD 800-1100. These sites contain rich archeological deposits, stone structures and a plethora of rock art, they are believed to be the remains of the Apishipa Culture, a High Plains group with ties to the Southwest. The total amount of rock art may be the most known for Forest Service administered lands.

The Canyonlands also contains a wealth of paleontological resources with Dakota Sandstone and Morrison Formation deposits dating to the Jurassic Period. The most significant paleontological resource is the Purgatoire River Dinosaur Tracksite where over 1300 individual track prints of Jurassic dinosaurs are preserved in Morrison limestones. The tracksite is a priceless scientific and visitor education resource; it is prominently cited in the paleontological literature pertinent to studies of Jurassic fauna. The local geologic strata also contain dinosaur bone and invertebrate fossils dating to the Jurassic, and these locations are currently being mapped.

1. Seeding of high intensity burn area and areas of concern for soil and vegetation losses (approximately 230 acres). This included ground broadcast seeding of two general soil types. Each soil type was given an unique seed mix adapted to the soil characteristics. Sand dropseed was one of the species in both seed mixes and was added by the Ranger District with funding from soil and water. This species has a very high seed count per pound, but it has been shown to be one of the best species for reclamation purposes on the sandy soils and dry climate of this part of Colorado. The 2 mixes used are shown below by soil type.

1. Dry sandy fluvial deposits along the bottom river terraces. In many areas all organic matter was consumed and the threat of wind erosion immediately following the fire was high. Annual instantaneous peaks can reach 10 feet above the stream bottom and had the potential to affect these terraces. Average annual flows are normally 2-3 feet above the bottom of the stream. This seed mix included 62 seeds/sq ft or 10 lbs/acre plus and additional 30 seeds/sq ft (1/10 lb/ac) of Sand Dropseed added by the soil and water program of the grasslands.

Sandy Mix	lbs/acre	seed/sq ft
Annual Ryegrass	3	14
Paloma Indian Ricegrass	4	21
Blackwell Switchgrass	3	27
	10	62

Treatment Summary The sandy soils were extremely loose and a great deal of seed was lost due to wind erosion. The Sand Dropseed seemed to be the best species for long term rehabilitation. Annual plants of the area grew in greater density and amounts than the pre fire conditions. Dominant annual plants included Kochia, Russian Thistle, goosefoot and sunflowers. The annual species began sprouting 1 month following the fire. The density of the plants shaded the grass species beneath. Fuels of the area may be in greater amounts one year following the fire than the pre-fire conditions due to the amount organic matter from the annual plants. Approximately 10 acres of the sandy soils were treated with mulch. The areas that received 2-4 tons of mulch had the best growth of the seeded grasses. The mulch seemed to cause a shading of the soil surface and prevented the annual species from dominating the site. Future burns in similar soil types should require the use of Sand Dropseed and use of erosion blankets or thick mulch to prevent the invasion of the site by annuals. The natural revegetation by existing annual species without any shading of the soil surface may increase the fire danger to levels higher than the pre-fire conditions. Other possibilities include mowing of the sites following vegetation reestablishment or grazing to limit the growth of annual plants.

2. Sandy loam alluvial fans at the base of side canyons. Seeding of these areas was implemented to protect from surface wind erosion concerns. These areas were abandoned farm fields that have high calcium carbonate content at the surface. Crusting of the surface was observed with these soils following removal of the organic matter. This mix included 62 seeds/sq ft at 9 lbs/acre. The Ranger District added 30 seeds/sq ft (1/10 lb/ac) of Sand Dropseed with soil and water funds. The Ranger District also added 2 additional species thorough wildlife funding. These included Barton Western Wheat 3 lbs/acre and Blue Grama 3 lbs/acre.

Sandy Loam Mix	lbs/acre	seeds/sq ft
Blackwell Switchgrass	3	27

Paloma Indian ricegrass	3	21
Annual Ryegrass	3	14
	9	62

Treatment Summary The soils of these areas were old farm fields that had a crust on the soil surface following the fire. Disking and shallow harrows were used to break the soil surface in many areas that were seeded. As with the sandy soils much of the seed was lost due to wind erosion. Mulching of these areas was completed on approximately 20 acres. The mulch did not have as beneficial effect as it did on the sandy soils. The difference may be due to lower rates 1-2 tons/acre of mulch used on the loamy soils. The invasion of annual species was generally greater than the sandy soils. However, the growth of the native grasses as well as the seeded species was also greater. The higher nutrient contents and greater water availability are probably the reason for greater growth of the annual and perennial species. The fire danger in these areas will probably be higher in 1997 than it was before the Canyon fire of 1996. Future rehabilitation recommendations include shading of seeded areas, mowing or grazing to reduce the increase in fuels. It is expected that additional growth of the seeded grasses will take place in 1997.

2. Broadcast seeding (approximately 80 acres) adjacent to heritage and paleontological resources that are in danger of soil erosional losses. Grass species included Blue grama, Side oats Grama and little bluestem at a rate of 78 seeds/sq ft (9 lbs/acre).

	<u>lb/acre</u>	<u>seeds/sq ft</u>
Heritage mix: Blue Grama	3	56
Side Oats Gram	3	13
Little bluestem	<u>3</u>	<u>9</u>
	9	78

Treatment summary Hand seeding and raking were completed around heritage resources on approximately 20 acres. Results of the seeding were similar to the loamy soil broadcast seeding. The seeding did not appear to be an effective means of emergency control around the heritage resources. The grasses take several months to develop a vegetative protective cover. More appropriate emergency treatments could have included plantings of shrubs and cactus that were burned in the fire, use of erosion fabric to prevent annual forbs from growing, and installation of small barriers of rock or straw to slow runoff.

3. Temporary fencing of approximately 2 miles to protect seeded as well as critical areas during revegetation from cattle. Over 10 miles of boundary fence is in need of repair. The temporary fencing is to protect critical areas from cattle while permanent fencing can be repaired. This is critical since it is spring green-up time and herbivory and compaction could significantly alter vegetation and soil composition following fire.

Treatment Summary The temporary fencing was not completed. Cattle were found in areas that were treated with mulch. Losses of the mulch and some of the seeded grasses occurred due to the trespass cattle. Approximately 1/2 mile of existing fence was repaired. This included replacing 1 or 2 strands of barbed wire and approximately 20 poles to existing fence in the area. In the future, temporary fencing is recommended for areas that are not to receive any disturbance such as mulched areas. Mowing or cattle however, may be a viable means of reducing growth of annual plants in areas that have been seeded but have not received erosion blankets or mulch.

Without action, there will be a quantifiable loss of archeological deposits due to erosion, and loss of surface artifacts and information due to increase in illegal collection.

B. Historical resources. Most historic sites are in the canyon bottom. Erosion of deposits is less of a threat, but still present. The loss of surface cover has exposed significant quantities of historical items, more so than at prehistoric sites. Loss of fencing at the Dolores Mission and Cemetery will result in greater impacts to the headstone area by visitors and by trespass stock. Loss of ground cover and structural wood at the Damascio Lopez Homestead threatens the structural stability of the standing adobe walls. Without action, there will be a structural loss at the Lopez homestead and greater deterioration at the Dolores Mission. There will also be increased loss of surface artifacts and information from illegal collection.

IV. RECOMMENDATIONS.

The following are the specific treatments recommended to recover the loss caused by the fire and mitigate the immediate post-fire threats to the resource.

A. Archeological (prehistoric resources). No fire-caused damage was noted during the rehabilitation survey, and no archeological recovery measures are recommended. To deter erosion, seeding of some of the archeological areas is recommended; this includes a total of 230 acres in seven separate locations (map provided):

SW 1/4 of Section 4 - 20 acres

NE 1/4 of Sec. 24 and NW 1/4 of Sec. 19 - 40 acres

SE 1/4 of Sec. 7 and SW 1/4 of Sec. 8 - 35 acres

NE 1/4 of Sec. 8 - 40 acres

SW and NW 1/4s of Sec. 4 - 40 acres

NW and NE 1/4s of Sec. 4 - 30 acres

NE 1/4 of Sec. 4 and NW 1/4 of Sec. 3 - 25 acres

TOTAL - 230 acres

In addition, it is recommended that approximately 10 rock water dams, per minor drainage, be located to minimize channelization and headcutting. There are approximately 10 drainages that need this treatment.

B. Historical resources. Archeological recovery and repair/stabilization are recommended at several of the historical sites:

The Calving Shed (5LA6533):

Controlled collection of surface artifacts - COST: \$750

Repair of stockade - COST: \$3000

Damacio Lopez Homestead (5LA5842):

Controlled collection of surface artifacts - COST: \$2000

Stabilization of standing adobe walls - COST: \$7500

Also, it is recommended that fencing damaged by the fire be repaired/replaced at the Rourke Ranch, and CRITICALLY, at the DOLORES Mission and Cemetery. Screening vegetation should be provided at the Dolores Mission and the Damacio Lopez Homestead/Frost Ranch.

Repair fencing at Rourke Ranch (50 feet) - COST:

Repair fencing at Dolores Mission (100 feet - COST:

Install screening vegetation at Dolores Mission and Lopez Homestead (20 juniper and 20 cholla) - COST:

C. Paleontological resources. In regards to the tracksite, the survey did not reveal any increase in fallen debris originating from burned cottonwood or tamarisk; in fact, most fallen limbs and trunks were completely consumed. Thus, an increase in debris causing diversion of river flows does not seem to be a threat. Stream structures in the vicinity of the tracksite and/or hardening of the limestone strata bearing the tracks is recommended as a long term project for the Ranger District.

D. Soil and Vegetation Resources. Approximately 310 acres has been recommended for seeding. This includes seeding of high intensity burned streambanks, poor soil condition abandoned fields and some canyon toeslopes. The seed mix emphasizes native species for reclamation of the canyon. All cat lines will be seeded by the Ranger District if they are not completed by the FFF funds with onsite crews. These are located on the south end of the burn.

Several vegetation photo points were taken and it is recommend that these be taken again 2-3 weeks following the control of the fire and again 3 months following fire. Additional rehab needs can be determined at these times.

The forest should immediately develop a list of opportunities for soil and vegetation enhancement, if any, with the window of opportunity that currently exists. Many species will be suppressed following the fire for a short period of time and goals of increasing or decreasing species composition or diversity will be easier to accomplish at this time. This fire can also be used to show the potential effects of a prescribed fire in similar vegetative and soil types. Long term vegetative changes and soil movement permanent plots could be established. This would provide information for future burn plans to meet specific management goals.

Recreational visitors opportunities are focussed on the cultural resources and the dinosaur tracksite, and the spectacular natural setting. Few developed amenities are provided, consistent with the semi-primitive ROS setting. A pedestrian/horse/bicycle trail provided access to the tracksite and toilets are provided at the tracksite and at the Rourke Ranch. Minimal signing to guide the visitor is provided along the trail and cultural resources and the tracksite. Guided four-wheel drive tours to the Rourke Ranch rock art, the Mission and Cemetery, and the tracksite also are provided.

II. FIRE DAMAGE

The fire burned over approximately 6500 acres of Forest Service administered lands including many areas featuring high densities of archeological and historical sites. Of the known 410 cultural resources in the Northern Parcel of the Canyonlands, approximately two-thirds, or 270 sites were burned over. Special efforts were made during the fire-fighting efforts to protect the most significant resources, specifically the Rourke Ranch and the Dolores Mission and Cemetery, and these efforts were largely successful. However, some damage did occur. No fire suppression damage is known, as the archeologists assigned to the fire were able to implement avoidance measures. The Dinosaur Tracksite was also successfully protected. The following is a detailed description of known damage.

A. Archeological (prehistoric) resources. The fire burned over many of the large prehistoric Apishipa sites that contain structures, large archeological deposits and rock art. A survey of these sites revealed no measurable damage. Soils were generally not affected or only affected to a depth of 1-2 inches. Where juniper trees burned, soils were burned a few inches deeper. No damage to structures was observed. No damage to rock art was observed; however, some spalling of the faces of sandstone boulders was observed where consumed juniper trees were close to the rock face, so it is possible some damage sites not visited during the survey did occur.

B. Historical resources. Measurable damage did occur, primarily to the wooden component at these sites. The specific instances are as follows:

Rourke Ranch Calving Shed (5LA6533). The fire burned approximately 350 feet of stockade south of the calving shed. The stockade functioned to corral stock at the shed.

Rourke Ranch Complex proper (5LA5826). The fire burned over the stockpile bone yard east of the barn and stable, destroying a wooden stock trough, stockpiled fenceposts and milled lumber and scrap stored in this location for possible salvage. The fire destroyed approximately 100 feet of fence and also burned the historic dump.

Minnie Canyon Corral (5LA6345). The fire completely destroyed the corral; archeological deposits here survived.

Dolores Mission and Cemetery (5LA5844). The fire burned approximately 100 feet of fence along the south and east sides; the church and headstone area was protected. Across the road, the fire burned some of the wooden support structure (approximately 15 fallen beams and standing vertical poles) for the associated barn/stable).

Damacio Lopez Homestead/Frost Ranch (5LA5842). The fire consumed most wood remaining at this site, including virtually all structural beams and posts (estimate 50-100 total).

C. Paleontological resources. The dinosaur tracksite was not burned over. Damage to paleontological deposits is estimated to be minimal because the fossil-bearing strata were not much affected by the fire.

D. Recreation improvements. No improvements were affected. There is a possible beneficial effect because the fire and the subsequent succession and recovery can be interpreted.

E. Soil and Vegetation Resources. Field surveys of the fire intensity showed minimal damage to the soil surface horizons. In most areas residual organic matter was more than 30% of pre-burn conditions. The potential losses will generally be tied to future climatic patterns and storm intensity. The greatest erosion potential and sediment transport may occur along streambanks of intensively burned tamarisk and cottonwood. Any flooding in the next few months may cause some sediment to move due to the loose sandy deposits found along the bottom floodplain terraces. The other areas of concern include some of the abandoned fields and greasewood flats. These areas had a pre-burn condition of hard crusted surface soil, probably due to high calcium content and past management use. Regeneration is limited due to poor aeration and moisture storage. These areas have little residual organic matter cover and therefore cannot hold moisture when it occurs. Disking and seeding are recommended. The canyon walls have the greatest inherent erosion potential. However, we did not observe any fire intensities on these soils that is of emergency rehab needs. Many areas where the organic matter seems to be completely consumed in the soil surface had very little pre burn material. This include some of the bare sandy terraces that did not have any woody species or grass cover. These areas will come back very strong to early seral species including many of the "weed" species as identified in the canyon floodplain.

The mesa tops, which include juniper-blue grama associations, appeared to burn with low to moderate intensity. Many areas were observed where only the sod forming grasses were burned and the flames did not reach into the juniper scattered throughout the unit. Concerns are limited to small acreages on the mesa tops.

Potential losses of soil and vegetative resources will be increased if cattle are not kept off of naturally regenerating vegetation and any seeding that may be done along the floodplain terraces. We notice cattle already on the burn two days after been determined controlled.

III. POST BURNING THREATS TO RESOURCES.

For specifically the archeological, historical, and paleontological resources, the threats are predicted to emanate from three sources: increased erosion, greater flood severity, and increased visitor use, damage, and vandalism. Specific threats are described as follows:

A. Archeological resources. Most prehistoric sites that were burned over are located on the talus or on side slopes. Many have undulating topography with small drainages. Because of the loss of vegetation, water erosion along and at the heads of these drainages is a threat. Loss of vegetation has also rendered the location of archeological sites more obvious and bared the surface, thereby increasing the possibility of surface collection of artifacts.