

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

A. Type of Report

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

B. Type of Action

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

PART II - BURNED-AREA DESCRIPTIONA. Fire Name: PenascoB. Fire Number: P37060C. State: NEW MEXICOD. County: OteroE. Region: R-3F. Forest: LincolnG. District: SacramentoH. Date Fire Started: 4/30/2002I. Date Fire Contained: 5/8/02J. Suppression Cost: \$4,273,195 as of 1/28/03

K. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): 35.6
2. Fireline seeded (miles): 11
3. Other (identify):

L. Watershed Number: 13060010010M. Total Acres Burned: 15,143

NFS Acres(10,031) Other Federal () State () Private (5,112)

N. Vegetation Types: PONDEROSA PINE; PINYON – JUNIPER; MIXED CONIFER; OAK SHRUB; MTN GRASSLAND

O. Dominant Soils: LITHIC ARGIUUSTOLLS; LITHIC HAPLUSTOLLS; LITHIC ARGIBOROLLS; LITHIC HAPLBOROLLS; PACHIC ARGIBOROLLS; UDIC ARGIUUSTOLLS; TYPIC ARGIBOROLLS; MOLLIC EUTROBORALFS; soils are shallow and have high erosion potential.

P. Geologic Types: YESO AND SAN ANDRES FORMATIONS: Yeso Formation derived soils have a extremely high erosion potential.

Q. Miles of Stream Channels by Order or Class:

1st 34.4

2nd 10.0

R. Transportation System

Trails: 0 miles

Roads: 67.5 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 3365 (low) 7785 (moderate) 3993 (high)

B. Water-Repellent Soil (acres): 500

C. Soil Erosion Hazard Rating (acres):

5123 (low) 5235 (moderate) 4785 (high)

D. Erosion Potential: 50 tons/acre

E. Sediment Potential: 45,000 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 15

B. Design Chance of Success, (percent): 70

C. Equivalent Design Recurrence Interval, (years): 5

D. Design Storm Duration, (hours): 24

E. Design Storm Magnitude, (inches): 2.7

F. Design Flow, (cubic feet / second/ square mile): 265

G. Estimated Reduction in Infiltration, (percent): 10

H. Adjusted Design Flow, (cfs per square mile): 130

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency: The watershed emergency consists of threat to downstream lives and property and to soil productivity from on-site soil loss due to loss of ground cover. Flood hazard, sedimentation and debris flows are complicated by the loss of ground cover due to the fire and pose a threat to areas downstream. Severe and mosaic burn, which include portions of high intensity burned areas, cover 8,000 acres and are concentrated in Curtis Canyon, a major tributary to the Rio Penasco.

Fire burned with high intensity in Curtis Canyon, Rio Penasco, James Canyon, and Cox Canyon watershed above Syvil's Baptist Camp. These canyons were burned with a very high intensity fire, loss of private property occurred in some locations including an entire residential subdivision in Curtis

Canyon. Threat to downstream lives and property exists from potential flooding due to the location of residences and recreational development immediately downstream from high intensity burned watershed on steep slopes, with soils subject to severe erosion and potential for serious runoff.

The burned area is largely located within the watersheds of Curtis Canyon, Rio Penasco and James Canyon a highly used recreational area which are all part of the Rio Penasco 5th code watershed. This watershed has been designated by the state of New Mexico as not fully supporting the designated use of cold water fishery for the water in this stream. The reason for nonsupport of designated use in this reach is stream bottom deposits, this situation will only worsen should sediment laden runoff from the burned watershed enter the stream.

Rio Penasco is fish habitat and concern has been expressed that this habitat will be greatly threatened should sedimentation affect the stream.

Effective ground cover and canopy cover removal in the severely burned watersheds is close to 100%. Much of the burned area has shallow soils with silt loam and loam surface texture with little surface rock resulting in severe sheet and rill erosion potential. Substantial soil loss is likely without stabilization. Flood flows are likely to occur until ground cover is reestablished.

B. Emergency Treatment Objectives:

Retain high erosion potential soils on-site on the slopes above private property. This objective is to be achieved by using a combination of upland, channel and road treatments on steep slopes to retain soil, protect life and property downstream and maintain soil productivity on National Forest System Lands in Curtis Canyon, James Canyon and along the Rio Penasco. The timing of this effort is critical since the window of opportunity for success occurs prior to the onset of the monsoon season which generally begins the first of July. Coordination of the proposed treatments with treatments on private land is critical. The Natural Resources Conservation Service has requested \$1,750,000 of Emergency Watershed Protection funds for similar treatments on private land within the Penasco Fire.

Treatment of these private lands is essential to the success of treatments on the forest. This is the rare case where significant private lands lie above NFS Lands. Cooperation and interest from Otero County and communities within the effected area is high. Volunteer groups have indicated they are interested in helping with implementation of treatments.

The knowledge gained from the experience associated with the Scott Able Fire and BAER efforts of 2000 has sensitized the communities and public agencies of the gravity of the threat that exists as a result of the Penasco Fire.

There has been much thought and discussion given to our ability to implement this magnitude of treatments prior to the onset of the monsoon which usually begins the first week of July. It is the intent of the implementation team to have multiple work activities occurring simultaneously. There are sufficient resource advisors available to insure that the treatments are constructed to specification. In the event that the monsoon establishes prior to to it's historic timeframe then further assessment may be necessary.

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

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

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	50	70	80
Channel	50	70	80
Roads	50	70	80
Other			

E. Cost of No-Action (Including Loss): \$8,000,000 or more including private property. Potential additional cost to a tourist based economy from loss of the aesthetic value of the Rio Penasco. Water quality impacts to a portion of a potential fishery resource, and a State designated non-attainment stream.

F. Cost of Selected Alternative (Including Loss): \$4,000,000 (assumes 30% loss to private property)

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Email: bdancker@fs.fed.us Phone: 505-434-7250 FAX: 505-434-7218

H. **Treatment Narrative:**

Land Treatments:

Aerial application of three perennial species and one annual specie of seed is proposed. The intent is to jump start the stabilization of soils on that portion (5,000 NFS acres) of the severe and mosaic burn through the establishment of vegetative cover to maintain on-site productivity and protect downstream water quality and property. This mix includes smooth brome (30%), orchard grass (30%), slender wheatgrass (30%) and annual ryegrass (10%) at a rate of approximately 9 pounds per acre of PLS (50 seeds per square foot). The primary watershed proposed for aerial seeding is Curtis Canyon. This seed mixture was selected, in part, because of the success of a simular mixture used on the Scott Able Fire. Ecologically and climatically, there is little difference between the lands comprising the two fires.

The mouth of Curtis Canyon watershed contains a large sediment detention basin, constructed in the 1950s to minimize the flood threat to numerous homes below in Curtis and Rio Penasco drainages. The dam and spillway are located on private land with most of the impoundment on NFS Lands. *Sediment removal from behind this flood control structure will be required. Field observations reveal that large amounts of sediment and debris are in the watershed above the dam and readily available for movement. Approximately 20,000 cubic yards of sediment will be required to be removed from behind the dam.* This situation also provides a source of construction material.

The NRCS proposes to seed 3,000 acres of severe and mosaic burn on private lands with EWP funds. (See attached burn severity/treatment map for locations of specific treatments.)

Log erosion barriers (LEB's) are proposed on north aspects of the canyons draining into James Canyon in the Hortonville area. There is a 200 acre block comprised of six first and second order drainages that are characterized by severe burn and steep slopes. However, not every acre would be treated in that a buffer above each drainage would receive treatment.

Approximately 35 LEBs per acre are required to be effective. Numerous homes are located immediately adjacent to NFS Lands. The south aspects will require treatment also, however, the dead standing trees are not of sufficient diameter to make an LEB.

Given the relatively short trees that exist on the site (a 9-14 inch diameter tree is desired), these slopes would be treated with straw mulch with the intent of replacing the litter layer at a rate of 35 bales to the acre. Straw will be spread by hand. Again a buffer above the active channel would be treated. Access has been granted through the private land. The straw bales will be delivered via helicopter. The possibility exists to chip the trees on site if this equipment is available.

Channel treatments in the six drainages in this area will be discussed below. The NRCS is proposing to install jersey barrier eyebrows above the homes to divert flow and debris as part of the private land treatment with EWP funds.

NFS Lands above Sivell's Camp will be treated with LEBs as this area received severe burn on steep slopes. Numerous structures associated with the Camp lie immediately below the Forest.

A third area proposed for treatment with LEBs lies in the extreme southwest corner of the Fire in a 150 acre block that is characterized by severe burn and steep slopes which drains into the Rio Penasco. A total of 500 acres is proposed for LEBs in three separate areas identified on the attached map.

The suppression organization for the Penasco Fire is conducting rehab on hand and dozer lines as part of the wrap-up of the suppression effort. This includes drainage and hand seeding.

Channel Treatments:

Log check dams are proposed in the Hortonville area, as described above. These sediment retention structures will provide another avenue of protection to homes immediately below. This treatment is warranted given the burn severity, steep slopes and proximity to homes below. Standing dead trees would be utilized for construction material. Access through the private land has been granted and excavating equipment will be used to dig into the channel banks to secure the logs. A filter cloth membrane will be applied to the up-stream side of the structure to promote the retention of ash, debris and sediment. The height of these structures would not exceed four feet with notch and would include a rock apron. Multiple structures per channel are proposed. Straw bale structures were considered but not planned as the rocky soil will not accommodate a wooden stake. The maze of rebar that would remain when the straw bale structures deteriorate was deemed unacceptable.

Trash racks are being proposed above culverts on roads and spillways to minimize the clogging with debris. These would be constructed from standing dead timber in areas draining severe burn. The size would vary with the configuration of the channel and available standing dead timber. The intent is to promote the movement of water through the system with a minimum of obstruction from debris.

A network of earthen check dams and trash racks is being proposed for Curtis Canyon and tributaries. Earthen check dams were deemed the only practical alternative due to the size of the channels and the magnitude of flows that can reasonably be expected. Trash racks are

designed to prevent the plugging of spillways by catching residual debris which could clog spillways and threaten dam and road crossing stability.

Most of the structures would be relatively low in height (four feet or less) with keyways and spillways. However, a few earthen dams will be as high as 25 feet. The intent is to reduce the velocity and minimize the sediment and bedload. The necessary hydrology and engineering for design purposes are readily available as are a number of local, knowledgeable, available contractors with heavy equipment.

The removal of standing dead trees which could break and fall into the channel and other debris which could clog spillways and threaten structures needs to be completed prior to the rainy season beginning in July. Field observations reveal that massive amounts of sediment, debris and great numbers of standing dead trees are in the system and readily available for movement.

The Sacramento Ranger District ordered and has made operational a remote automated weather station (RAWS) in upper Curtis Canyon with the intent of providing real-time weather data, including precipitation, for the safety of the public in the watershed below and suppression and BAER personnel working in the drainage. Currently, this real-time weather data can be obtained with a forest net radio simple by keying the correct frequency. The Penasco Fire has paid for this. The funds requested would pay for the operation, maintenance and retrofitting of this instrument into an Early Warning System that would alert personnel in the Otero County Sheriff's Office. There is general agreement that this capability is very necessary. This instrument is available from NIFC at least through the middle of September, 2002.

Roads and Trail Treatments:

NM Highway 130 along the Rio Penasco for approximately 3 miles contains stretches of severe burn on 40 % plus slopes. Other than aerial seeding, there is little opportunity for treatment to mitigate the runoff and associated debris that will run down onto the highway with a storm event. In conjunction with the NM Highway Department, we propose to line approximately 2000 lineal feet of this reach with jersey barriers to minimize flow and debris onto the highway and to channel it to strategic places to cross the highway and into the Rio Penasco. Some used jersey barriers are available from the Highway Department as are new jersey barriers. Otero County and NM Highway Department have the necessary specialized equipment to handle jersey barriers and funds will be requested to have them do this. Very shortly, the necessary agreements will be in place to facilitate payment to them for this work.

Some crossings contain culverts on low volume roads where the most prudent action is to remove the culvert and create a low water crossing until the emergency has passed. This will be done at some locations.

Heavy road maintenance funds will be necessary, based on experience from the Scott Able Fire. Despite the best of efforts, BAER treatments will not be totally effective and there is little doubt that this maintenance activity will be necessary to keep Forest maintained roads safe and passable. The option of closing roads remains a viable option, however precise locations are impossible to identify at this point. National Fire Plan Rehabilitation and Restoration funds will be requested to address these concerns.

Structures: N/A

H. Monitoring Narrative:

There is a need to monitor the effectiveness of all treatments implemented as part of the Penasco Fire BAER. This will require one week after the summer monsoon season by two journey level resource specialists. A detailed monitoring plan will be submitted as a separate document to the Regional BAER coordinator

Approximately 342,000 gallons of fire retardant was dropped on the Penasco Fire. This includes 222,000 gallons of PHOS-CHEK brand retardant from the Alamogordo Base which contains no known toxic materials. The remaining 120,000 gallons of retardant was Fire-Trol from the Roswell base which does contain sodium ferrocyanide, a rust inhibitor. It is not known where the Fire-Trol was dropped on the fire. The concern is for the chemical that results when UV radiation breaks down the chemical bond resulting in free cyanide. Free cyanide volatilizes in approximately 96 hours and becomes harmless. When the retardant is applied in thick layers the cyanide does not dry out as fast and is not exposed to UV. This is probably not the case on the Penasco Fire. Furthermore, there are no perennial channels on the fire area to move the material into a fishery or a downstream domestic water system.

Part VI – Emergency Rehabilitation Treatments and Source of Funds by Landowners

Line Items	Units	Unit Cost	# of Units	WFSU SULT \$	Other \$	# of units	Fed \$	# of Units	Non Fed \$	Total \$
A. Land Treatments										
Seed and application	acres	11.85	5500	\$65,200		3000	\$39,000		\$0	\$104,200
Log Erosion Barriers	acres	500	400	\$200,000			\$0		\$0	\$200,000
Straw mulch & appli.	acres	570.7	200	\$114,140			\$0		\$0	\$114,140
<i>Subtotal Land Treatments</i>				\$379,340			\$0		\$0	\$418,340
B. Channel Treatments										
Earthen check dams	struct.	800	165	\$132,000			\$0		\$0	\$132,000
Log check dams	struct.	1750	210	\$367,500			\$0		\$0	\$367,500
wooden trash racks	struct.	3267.6	85	\$277,745			\$0		\$0	\$277,745
Curtis Ca. Dam clean	Cu. Yds	13.53	30000	\$405,760			\$0		\$0	\$405,760
<i>Subtotal Channel Treat.</i>				\$1,201,745			\$0		\$0	\$1,201,745
C. Road and Trails										
Jersey barriers	feet	33.47	195.6	\$6,546			\$0		\$0	\$6,546
				\$0			\$0		\$0	\$0
				\$0			\$0		\$0	\$0
<i>Subtotal Road & Trails</i>				\$6,546			\$0		\$0	\$6,546
D. Structures										
				\$0			\$0		\$0	\$0
				\$0			\$0		\$0	\$0
<i>Subtotal Structures</i>				\$0			\$0		\$0	\$0
E. BAER Evaluation										
Assessment	1	26500	1	\$26,500			\$0		\$0	\$26,500
				\$0			\$0		\$0	\$0
G. Monitoring Cost	days	275	10	\$2,750			\$0		\$0	\$2,750
H. Totals				\$1,598,141			\$0		\$0	\$1,637,141

PART VII - APPROVALS

1. /s/ Larry Sansom
Forest Supervisor (signature)

2/03/2003
Date

2. _____
Regional Forester (signature)

Date