Date of Report: 11/08/2010

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[X] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[X] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

[ ] 2. Interim Report #____.
[ ] Updating the initial funding request based on more accurate site data or design analysis
[ ] Status of accomplishments to date

[ ] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Virgin Canyon Fire

B. Fire Number: NM-SNF-000153

C. State: NM

D. County: Sandoval

E. Region: 3

F. Forest: Santa Fe

G. District: Jemez RD

H. Fire Incident Job Code: P3FW9K

I. Date Fire Started: October 8, 2010

J. Date Fire Contained: October 30, 2010

K. Suppression Cost: unknown at this time

L. Fire Suppression Damages Repaired with Suppression Funds
1. **Fireline waterbarred and slashed (miles)**: 1
2. **Fireline seeded (miles):** XXXX
3. **Other (identify):** Significant road drainage work will start on November 8, 2010

M. Watershed Number: Rio Guadalupe 5th Code (1302020201),
Upper Jemez River 5th Code (1302020202)

N. Total Acres Burned:
[1706] NFS Acres [ ] Other Federal [ ] State [41] Private

O. Vegetation Types: Ponderosa Pine

P. Dominant Soils: Primarily Typic or Udic Haplostalfs and Typic Ustorthents, fine-loamy to medial-skeletal, mixed, deep.

Q. Geologic Types: Bandelier tuff, sandstone, andesite and basalt

R. Miles of Stream Channels by Order or Class: 1st order: 4.4 miles, 2nd order: 0.7 miles

S. Transportation System
Trails: There is evidence of significant cross-country use within this area.
Roads: 17.5 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres):
Low - 1073
Moderate - 62
High – approximately 2 acres of small inclusions within the moderate
Unburned - 570

B. Water-Repellent Soil (acres): 0 acres

C. Soil Erosion Hazard Rating (acres): 335 **(moderate)** 1371 **(severe)**

D. Erosion Potential: 0.04 **tons/acre**

E. Sediment Potential: 0.10 **cubic yards / square mile**

PART IV - HYDROLOGIC DESIGN FACTORS

A.	**Estimated Vegetative Recovery Period, (years)**:	3
B.	**Design Chance of Success, (percent):**	65
C.	**Equivalent Design Recurrence Interval, (years):**	5
D.	**Design Storm Duration, (hours):**	24
E.	**Design Storm Magnitude, (inches):**	2.01
F.	**Design Flow, (cubic feet / second/ square mile):**	33

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

H. Adjusted Design Flow, (cfs per square mile): 64

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats (narrative):

The Virgin Canyon fire began on October 8, 2010 as the result of a lightning strike. The burned area is located on Virgin Mesa directly west of the town of Jemez Springs, NM. The burned area is entirely on National Forest System lands managed by the Jemez Ranger District of the Santa Fe National Forest.

Burn severity is a measure of hydrologic response due to loss of canopy, groundcover and alteration of surface soil/water interactions that are caused by a wildfire. Burn severity is summarized as follows:

Approximately 2 acres of high severity (0.1%),
62 acres of moderate severity (3.9%),
1073 acres of low severity (63%), and
570 acres of unburned (33%).

Burn severity mapping for the Virgin Canyon burned area was done initially by field mapping within the fire perimeter. On October 29th a BARC map was obtained from RSAC from a satellite pass on October 27th.

Within Chapter 2520 of the FSM 2500 is 2523.1 – Exhibit 01 that outlines the "Critical Values to be Considered During Burned Area Emergency Response". Using this matrix the Virgin Canyon BAER assessment team determined that there are three critical values at risk within the Virgin Canyon burned area. These values are:

1. **Cultural and Heritage Resources**

   Previous surveys and post-fire assessment located a total of 157 cultural resources located within the perimeter of the Virgin Canyon Fire. 155 sites are archaeological or historic properties that are eligible or considered eligible for the National Register of Historic Places.

   Within the Virgin Canyon burned area, the vast majority of sites recommended for treatment area are associated with cultural development on the Virgin Mesa between A.D. 1250-1600. The most common property types affected by the Virgin Canyon Fire are collapsed field house structures and associated activity areas. These sites are associated with "Amoxiumqua", a massive pueblo located immediately outside the fire perimeter on Virgin Mesa.

   Although the Virgin Canyon Fire resulted in a low to moderate burn severity on the broad scale, fire damage to cultural resource sites is largely driven by intra-site characteristics that vary greatly across a given landscape. Direct effects to cultural resource sites are driven by the type of site components present (fire sensitive components such as wood or resilient components such as rock), depth of soil cover over buried archaeological deposits, and on-site fuel loading

characteristics. On-site fuel loads ultimately determine the duration and intensity of fire at a given location; both of which have a profound effect on cultural resource sites. In this way, direct fire effects to cultural resources are dynamic and varied across a specific fire affected area. Indirect fire effects to cultural resources are driven by factors such as intra-site topography, soil stability, presence/absence of post-fire vegetative cover, and the susceptibility of fire killed trees to wind events.

2. **The presence of small populations of noxious weeds**

   There are known populations of musk and scotch thistle (approximately 20 acres total) within the fire perimeter. It is expected that the populations will spread due to the fire and associated suppression activities.

3. **Critical Habitat for federally listed threatened species**
   This treatment not approved by the Regional Office. Nov. 10, 2010.

   There are 880 acres of designated Critical Habitat for the Mexican spotted owl (a federally listed threatened species) within the boundaries of the Virgin Canyon burned area. This area is considered critical habitat because of the available foraging habitat adjacent to Protected Activity Centers for Mexican spotted owl nesting areas in Virgin Canyon. One of the primary constituent elements of Critical Habitat is high volumes of fallen trees and woody debris to provide habitat for prey species.

   The Virgin Canyon burned area also provides nesting and foraging habitat for the northern goshawk, a USFS Region 3 sensitive species. Large woody debris is an important component for providing habitat for prey species of the goshawk.

   Although the majority of the Virgin Canyon Fire burned with low severity, there are some pockets of moderate and high burn severity, where it is estimated that 30 to 50% of the large woody debris was totally consumed. Approximately 43 of these acres are in Critical Habitat for the Mexican spotted owl. All of the 64 acres of moderate and high burn severity are within northern goshawk habitat.

   Forest Plan goshawk guidelines recommend at least 3 pieces of large woody debris (=>12" diameter) per acre. These guidelines can also be used to estimate needs for Mexican spotted owl prey needs. Using the 50% consumed estimate (to err in favor of species), 1.5 pieces of large woody debris would have been consumed per acre. Fire-killed trees will eventually die and fall, however, to replace large woody debris more quickly to retain prey habitat, it is recommended that 1.5 trees/acre be felled in the moderate severity areas, for a total of approximately 96 trees.

B. Emergency Treatment Objectives (narrative):

1. Treatments for cultural resource protection include three types of activities.
   a. Section 106 report preparation required to implement preventative treatments at known archaeological sites.
   b. Treatment actions to stabilize the condition of the sites.

c. Monitoring after first damage-inducing storm to determine the success of the treatments.

2. Survey and treatment for the spread of noxious weeds during the spring and fall of 2011.

3. Felling of approximately 1.5 trees per acre in the moderate severity burn areas to replace large woody debris for prey habitat for Mexican spotted owl and northern goshawk. (This treatment was not approved by the Regional Office.)

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

Land 85% **Channel** XXX% **Roads/Trails** XXX% **Protection/Safety** XXX%

D. Probability of Treatment Success

	Years after Treatment		
	1	**3**	**5**
Land	60	75	95
Channel	XXX	XXX	XXX
Roads/Trails	XXX	XXX	XXX
Protection/Safety	XXX	XXX	XXX

E. Cost of No-Action (Including Loss):

Within Chapter 2520 of the FSM 2500 is 2523.1 – Exhibit 02 the "BAER Risk Assessment" matrix. Using this matrix the Virgin Canyon BAER assessment team determined the following risk for the three critical values at risk within the Virgin Canyon burned area. The values and associated risks are as follows:

Critical Value	Probability of Damage or Loss	Magnitude of Consequences	Risk
Cultural Resources	Likely	Major	Very High
Noxious weeds	Likely	Moderate	High
Critical Habitat	Possible	Moderate	Intermediate

1. Cultural resources are nonrenewable resources and they generally prove to be susceptible to post-fire erosion. There is a very high risk to some of the known cultural resources within the Virgin Canyon burned area. The estimated area runoff from the areas above these sites more

than doubles from the pre-fire condition. The Wildcat5 model estimates that the area runoff increases from 0.24 area inches on unburned soil to 0.57 area inches on the soil with a moderate burn severity.

Cultural resource sites are static resources, in that they are anchored to discrete landscape locations. The sites on the Virgin Canyon Fire are in somewhat unconsolidated soils which results in threats to these sites if the vegetation is removed during a fire.

2. There is a high risk associated with the noxious weed populations. If the known population of thistle is not surveyed for spread and then treated, the potential for the weed population to further take hold in the area is great.

3. There is an intermediate risk associated with the Critical Habitat for the federally listed threatened Mexican spotted owl. Other areas of the Virgin Canyon burn area, which burned at low intensity, should still contain large woody debris to sustain prey populations; however, replacement of large woody debris in moderately burned areas will ensure a quicker replacement of prey habitat over the entire area of Critical Habitat for Mexican spotted owl and northern goshawk habitat.

F. Cost of Selected Alternative (Including Loss): XXX

G. Skills Represented on Burned-Area Survey Team:

[X]	**Hydrology**	**[X]**	**Soils**	**[ ]**	**Geology**	**[X]**	**Range**
[ ]	**Forestry**	**[X]**	**Wildlife**	**[ ]**	**Fire Mgmt.**	**[ ]**	**Engineering**
[ ]	**Contracting**	**[ ]**	**Ecology**	**[ ]**	**Botany**	**[X]**	**Archaeology**
[ ]	**Fisheries**	**[ ]**	**Research**	**[ ]**	**Landscape Arch**	**[X]**	**GIS**

BAER Assessment Team Members:

- Jennifer Hill, Soil Scientist, Lincoln National Forest
- Denise Montoya, Soils/Range Tech, Santa Fe National Forest
- Lee Johnson, Archaeology Section Leader, Superior National Forest
- Tom Fuller, Archaeologist, Lake Tahoe Basin Management Unit
- Russ Snyder, Archaeologist, Huron-Manistee National Forests
- Dea Funka, Archaeologist, Grand Mesa-Uncompahgre-Gunnison National Forests
- Jo Wargo, Wildlife Biologist, Santa Fe National Forest
- Pete Grinde, Range Program Manager, Santa Fe National Forest,
- John Hutchison, GIS, Santa Fe National Forest,
- Greg Kuyumjian, Hydrology, Okanogon-Wenachee National Forest (modeling support),
- Mike Bremer, Forest Archaeologist, Santa Fe National Forest,
- Jeremy Kulisheck, Assistant Forest Archaeologist, Santa Fe National Forest

Team Leader: Erica M. Nevins, Santa Fe National Forest

Email: enevins@fs.fed.us **Phone**: (505) 438-5433 **FAX**: (505)438-5390

H. Treatment Narrative:

Land Treatments:

1. Cultural Resources
    a. Fell fire-killed trees located within or immediately adjacent to 41 known archaelogical sites. If untreated, these trees have the potential to uproot and damage portions of the site through soil displacement and/or directly damage extant architectural features such as standing walls.
    b. Stabilize the soil surface on 21 sites with exposed mineral soil (complete consumption of duff and surface vegetation) with log checks, log deflectors, and/or straw mulching. Subsurface archaeolgical materials and architectural features in sensitive areas have the potential to be adversely affected through slope wash, burying, and undercutting.
    c. Stabilize 14 field house structures that have burned stump holes within or immediately adjacent to extant wall alignments. The stabilization treatment would be to line the burned hole with permeable landscape cloth and fill the stump hole with sterile, off-site fill. If not stabilized, these stump holes have the potential to adversely affect sub-surface archaeological deposits within the field house structures, and/or facilitate displacement of architectural features through erosion. Research by the US Park Service after the Dome Fire showed that if left untreated, these burned stump holes resulted in damage to the cultural resource site.
2. Noxious weeds
    a. Fund a noxious weed detection crew for 8 days in 2011 to survey for and treat noxious weeds within known area of invasive species and areas at risk of infestation (roads and hand lines). These areas would be surveyed during the early growing season of 2011 and again prior to the anniversary date of the fire's containment (October 30,2010). If invasive species are located, appropriate treatment would occur to treat infestations as they are discovered.
3. Wildlife prey habitat (This treatment was not approved by the Regional Office)
    a. Fund a felling crew in 2011 to drop and leave lay approximately 96 trees (limbing bottom branches so majority of tree is flush with the ground).

I. Monitoring Narrative:
(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

1. Monitoring of archaeological sites receiving preventative treatment will be conducted after the first damage inducing storm to determine the success of the treatments.
2. Noxious weed infestations that are treated will be monitored to determine treatment effectiveness. Protocol will be occular assessment with photos of each treatment site.

Part VI – Emergency Stabilization Treatments and Source of Funds **Initial 11-8-2010**

			NFS Lands			All
		Unit	# of		Other	Total
Line Items	Units	Cost	Units	BAER $	$	$
A. Land Treatments						
Tree felling and positioning around cultural sites	cultural sites	448.78	41	$18,400		$18,400
Erosion control and stump hole mitigation measures for cultural	cultural sites	80.95	21	$1,700		$1,700
Detect and treat noxious weeds	acres	4.3962	1706	$7,500		$7,500
~~Wildlife Treatment Supervision~~	~~trees~~	~~39.01~~	~~96~~	$0		$0
Insert new items above this line!						
Subtotal Land Treatments				$27,600	$0	$27,600
E. BAER Evaluation						
				---	$60,000	$60,000
Insert new items above this line!						
Subtotal Evaluation				---	$60,000	$60,000
F. Monitoring						
Monitoring of treatment for cultural resources	cultural sites	34.14	41	$1,400		$1,400
Insert new items above this line!						
Subtotal Monitoring				$1,400	$0	$1,400
G. Totals				$29,000	$60,000	$89,000
Previously approved						
Total for this request				**$29,000**		

PART VII - APPROVALS

1. _/s/Erin Connelly_____ November 8, 2010
   Acting Forest Supervisor (signature) Date

2. /s/Corbin Newman November 12, 2010
   Regional Forester (signature) Date