

(Reference FSH 2509.13)

NFS Acres(1,373) Other Federal (0) State (0) Private (39)

O. Vegetation Types:

Vegetation Type	Acres
Aspen (Birch)	43
Blue Spruce	48
Burned up (recent fire)	32
Douglas Fir	503
Grassland (covertype undetermined)	14
Ponderosa Pine	640
Stripmines, quarries, gravelpit	38
White Fir	94
Grand Total	1412

P. Dominant Soils: Mollic Vitrendepts

Q. Geologic Types: Pumice, Basaltic andesite, Dacite

R. Miles of Stream Channels by Order or Class:

Stream Type	Miles of Stream within Burned Area	Miles of Stream on NFS Land within Burned Area
Intermittent	0.73	0.73
Perennial	1.73	1.72
Ephemeral	6.30	5.9

S. Transportation System

Trails: 0.25 miles Roads: 16.6 miles

Road Maintenance Level	Miles of NFS Road within Burned Area
1 - BASIC CUSTODIAL CARE (CLOSED)	12.56
2 - HIGH CLEARANCE VEHICLES	4.04

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 689 (low/unburned) 619 (moderate) 102 (high)

B. Water-Repellent Soil (acres): 101

C. Soil Erosion Hazard Rating (acres):
0 (low) 268 (moderate) 1136 (high)

D. Erosion Potential: 3.3 tons/acre

E. Sediment Potential: 193 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):	<u>3-5 years</u>
B. Design Chance of Success, (percent):	<u>90</u>
C. Equivalent Design Recurrence Interval, (years):	<u>25</u>
D. Design Storm Duration, (hours):	<u>1</u>
E. Design Storm Magnitude, (inches):	<u>1.75</u>
F. Design Flow, (cubic feet / second/ square mile):	<u>21</u>
G. Estimated Reduction in Infiltration, (percent):	<u>50 %</u>
H. Adjusted Design Flow, (cfs per square mile):	<u>128</u>

PART V - SUMMARY OF ANALYSIS

The Cajete Fire, located on the Jemez Ranger District on the Santa Fe National Forest, burned on both sides of NM Highway 4 along the southern boundary of the Valles Caldera National Preserve. The fire started approximately one mile northeast of the community of Vallecitos de los Indios (Sierra de los Pinos). The burn area runs along the East Fork of the Jemez River and is west of the 2011 Las Conchas Fire burn scar and southeast of the 2013 Thompson Ridge Fire burn scar.

A. Describe Critical Values/Resources and Threats:

Value Category	Value-at-Risk (VAR)	Description of Threat	Specific Location	Risk	Alternative Response Actions
Human Life & Safety	N.F. Visitors, General Public & Agency Personnel	Threats to the public and forest employees from hazard trees along State Hwy 4.	State Hwy 4 for about 2 miles	Very High	The Fire Incident Command team has agreed to cut all imminent hazard trees along State Hwy 4 – No BAER treatment recommended. See Forestry Report.
			East Fork Trail	Very High	Closure is already implemented to protect public safety.
Human Life & Safety	Emergency Ingress/Egress & Loss of Access	Loss of emergency ingress/egress from hazard trees falling across the roads. These are maintenance level 1 and 2 roads.	Throughout the fire perimeter.	Low	These roads will not be accessible to the public. These are not on the MVUM and District personnel will only enter the area as needed when risk is mitigated.

Value Category	Value-at-Risk (VAR)	Description of Threat	Specific Location	Risk	Alternative Response Actions
Property	Forest Roads & Bridges	Threats to Forest roads and bridges from flooding and debris flows. Undersized culverts are likely to plug and severely damage road infrastructure with loss of NFS investment. [List potential routes needing field/site visits & analysis validation].	Vallecitos de los Indios crossing at NFSR 10	High	Clean gravel, soil, and sediment from under the bridge.
Cultural & Heritage Resources	Heritage	Threats to cultural resources from the movement of soils may impact cultural deposits and alter features that could result in a loss of information.	Fire wide.	Very Low	None. See Heritage Report
Natural Resources	Soil Productivity	Threat to the loss of soil and watershed function.	Areas of moderate and high burn severity.	Low	None. Low amount of acres of high burn severity. Moderate severity areas consist of less steep slope.
Natural Resources	Native communities on NFS Lands	Introduction of noxious weed species	Fire wide.	High	Noxious weed detection and response.
Natural Resources	Threatened and Endangered Species	Loss of designated critical habitat for ESA-listed Spotted owl from tree mortality.	Fire wide.	High	None recommended. See Wildlife Resource Report

B. Emergency Treatment Objectives:

The primary objective of the emergency BAER treatment are to:

- Reduce threats of changed post-fire watershed response on Forest Service Roads (FR 10)
- Noxious weed detection and response
- Reduce threats to community powerline from hazard trees to prevent ignition of future fire.

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

Land N/A % Channel N/A % Roads/Trails 80 % Protection/Safety 80 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land (Noxious Weed Early Detection & Rapid Response (EDRR))	70	80	80
Roads/Trails (Drainage and Closure)	80	100	100
Protection/Safety (Hazard Tree Removal along Hwy 4)	100	100	100
Protection/Safety (Storm Inspection & Response)	100	100	100

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

The cost associated with no-action would be: No-action could result in a 5 fold increase of cost over the treatment costs.

Value at Risk	Consequence	Cost of No-Action
Bridge on NFSL 10	The loss of the bridge from over topping or erosion of soil around buttress (see Engineering Report).	\$20,000
Noxious weeds	Increase spread of noxious weeds with impacts to natural ecosystems and at the closed and reclaimed El Cajete Mine site. ¹	\$2,240
	Total	\$22,240

¹ Estimate is based on 1 seasonal crew of 2 (\$280/day) for 3 days plus the costs associated with detection as described below.

F. Cost of Selected Alternative (Including Loss): **\$3,940**

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: R. William Amy, Santa Fe National Forest, Wildlife Program Manager

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BAER Assessment Team Members

Soils – Micah Keisow

Hydrology – Kate Mendoza

Engineering – Charles Hutchinson

Forestry – Sue Harrelson

Heritage – Mike Bremer

Heritage – Rebecca Baisden

GIS – Julie Luetzelschwab

GIS – Hillary Hudson

H. Treatment Narrative:

Land Treatments:

Noxious Weed Early Detection & Rapid Response (EDRR)

Invasive weed species are a major concern following wildfire. Removal of the extant vegetation by fire, and disturbance from suppression efforts such as bulldozer lines and staging areas, create openings for invasive plants to invade, and impede or prevent recovery of desirable vegetation. Areas within the Cajete Fire that have the greatest potential for noxious weed invasion are burned areas of moderate or high severity, or disturbed areas adjacent to or downstream of existing weed infestations. Disturbed areas should be surveyed to detect new infestations and treated immediately to prevent spreading.

Noxious weeds (i.e., Siberian Elm, cheat grass) known within the fire perimeter are class 3 as identified by the State of New Mexico (wide-spread in the state, and management decisions should be made at the local level based on the feasibility of control of the species and the level of infestation). Furthermore, other more invasive noxious weed species (e.g., bull thistle, broad perennial pepper weed, Canada thistle, Dalmatian toadflax, diffuse knapweed, leafy spurge, Scotch thistle, and spotted knapweed) have been found in areas in and near the forest and have the potential to be introduced into the fire area.

Noxious weed detection should be conducted in the area affected by the Cajete Fire due to the fact that invasive species have been detected in the area. Recommended that a 2 person crew (\$700.00/day) survey the camp, roads, and fire lines within the fire area to detect introductions of invasive species. This should take approximately 2 days.

Soil Productivity

Soil Burn Severity (SBS) throughout the Cajete fire was primarily low and moderate. Potential soil erosion rates range from just over 0 tons/acre in the low and unburned areas to over 15 tons/acre in the high SBS. Where moderate SBS occurred, large amounts of needles remain on trees that will provide ground cover once these needles drop; this process has already begun. Due to the large amount of unburned and low SBS acres, and the very small amount of high severity acres, the overall average soil loss across the burn area is relatively low. This yields a low risk to the loss of soil function and soil productivity except in those localized areas of high SBS. Due to the small extent of high SBS, the risk to loss of life, safety, and property within the burn area is low. However, due to the temporary loss of vegetative ground cover, the area is more susceptible to weed establishment.

Watershed (Hydrologic Resources)

The Cajete Fire burned 1,412 acres and had 722 acres of high and moderate burn severity. Areas with high and moderate burn severities have the potential to produce increased runoff and erosion amounts that would exceed pre-fire flows. The fire area contains ephemeral and intermittent drainages that may be subject to post-fire ash, debris, and sediment flows. Critical values at risk included: the concrete bridge at the intersection Vallecitos de los Indios drainage and FR 10, State Highway 4, and the hydrologic function of watersheds within the fire area. Hydrologic modeling was utilized to determine how watersheds in the fire area may respond to the loss of vegetation and decreased infiltration. Wildcat5, a model to predict pre- and post-fire peak flows, estimated that a 25-year, 1-hour storm, typical of a monsoon in the southwest area, would produce a post-fire peak flow of roughly 280 cubic feet per second which is six-times greater than pre-fire flows modeled at the FR 10 bridge using the same design storm. Other drainages saw similar increases in post-fire peak-flows, but the greatest impact may be to the FR 10 bridge in the Vallecitos de los Indios subdivision. An impact of a flow this size can cause substantial damage the bridge at FR 10 if it is not prepared to pass the flow. Currently, the FR 10 bridge has a reduced flow capacity due to sediment build-up in the channel above the bridge. To effectively mitigate potential damage to FR 10, it is recommended that the sediment and gravel deposits upstream of the bridge are removed to allow for the bridge to better handle post-fire peak-flows.

Cultural Heritage Resources

Assessment of post-fire effects to cultural and traditional resources on the Cajete Fire was conducted between June 17th and June 23, 2017. During the assessment, five cultural resource sites were selected for evaluation, and three of the sites were visited and two could not be accessed because of safety issues. The two sites that were not revisited were flown by Forest personnel who determined that the sites were on the fire perimeter edge and lay within the original fire scar of the Las Conchas Fire in 2011, meaning they had burned originally during the Las Conchas Fire and were likely not affected by the Cajete Fire and would not be affected by post-fire effects associated with the Cajete Fire. During consultation with tribal communities, it was expressed that there was no need to complete assessment of traditional cultural locations within the El Cajete fire. As a result of the assessment, no treatments for cultural resources and traditional cultural locations are proposed for post-fire effects associated with the Cajete Fire.

Threatened and Endangered Species

The Cajete Fire burned 1,016 acres of designated critical habitat for the Endangered Jemez Mountains salamander and salamanders have previously been found in the burn area. All of the burn area is either designated critical habitat (U.S. Fish and Wildlife Service, 2013) for the salamander or has the potential to be habitat for the salamander.

The post fire effects to the salamander will result in a diminished quality of critical habitat due to the use of retardant that will mobilize as monsoon rains wet the area. The toxicity effects of retardant to the salamander are not well known though it is recognized that retardant may adversely affect aquatic and other sensitive species such as amphibians (USDA 2015). Retardant may impede respiration should salamanders come in contact with it. Given the quantity of retardant used to suppress Cajete Fire (243,995 gallons), the probability of coming in contact with the retardant is quite high.

There is no strategy to mitigate the effects to the salamander from mobilizing the retardant in the habitat with rain events. Only through Natural Recovery can the effects from the retardant be neutralized over time.

Roads and Trail Treatments:

Roads

The reconnaissance of the roads and upstream drainages during the field investigations identified that there were zero culverts on any of the maintenance level 1 or maintenance level 2 roads within the burn scar. The roads are not currently showing excessive wear or damage. Maintenance level 1 roads do show some soil erosion, but this is not more than expected. The small concrete bridge along NFSR 10 has an excessive amount of soil and gravel deposits that will seriously restrict the flow. Cross sectional area has been restricted by approximately 2/3, thus reducing the bridges water transfer potential to 1/3 of its intended design.

The bridge currently can volumetrically handle only 1/3 of its designed capacity due to excessive soil and gravel deposits at its inlet and outlet points. These need to be opened up and the deposits removed to a separate location. The stream bed under the bridge has filled in with silt and soil and this needs to be cleaned out and removed as well. This would then allow the bridge to adequately handle the calculated maximum storm flow of 281 cubic feet per second, with a velocity of 8.8 feet per second. If the bridge is not cleaned, the potential for failure of the road and or roadway is possible with a high cost benefit ratio. The cost for repairs will include: mobilization costs, gravel, operator and equipment costs, and concrete cost to replace buttress if the bridge fails. These costs could be in excess of \$20,000.

The emergency response for the Cajete fire in regards to Engineering is to: a.) Close the maintenance level 2 roads, 4G & 4A, as well as the East Fork Trail to limit public access so as to ensure public safety, and b.) clean out under the bridge at NFSR 10 so as to bring its capacity back up to the design values

for water flow. This is more than a 10/1 cost saving mitigation (i.e., \$1,500) when compared with repair costs.

Protection/Safety Treatments:

Hazard Tree Removal

The objective was to identify hazard trees along State Highway 4 and the Jemez Mountain Coop power line within the fire perimeter to reduce the threat to the public and reduce threat of another fire from hazard trees falling across the power line. The Fire Incident Command team assessed trees along State Highway 4 and agreed to cut all trees that are an imminent hazard to the highway and public safety. Therefore, there is no request to remove hazard trees along State Highway 4.

It was determined that hazard trees along the power line operated by Jemez Mountains Coop did not meet the requirements to be considered for BAER funding. However, 92 hazard trees were identified and marked as part of the BAER assessment. These trees will be addressed through cooperation with the Jemez Mountains Coop and the Forest.

Road Storm Inspection & Response

The purpose of the storm inspection & response is to evaluate the condition of the NFSR 10 bridge for motorized access and to identify and implement additional work if needed to maintain or repair damage caused by high flows. District personnel will survey the bridge after high-intensity monsoon events in 2017. This would be accomplished by one engineering technician at \$260 per day with an estimated need to patrol 4 days during the 2017 monsoon season and potentially after snow melt events spring of 2018.

I. Monitoring Narrative:

Only the road treatments will need to be monitored, specifically the bridge on NFSR 10. This will be accomplished through storm inspection & response.

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #

			NFS Lands				Other Lands			All
		Unit	# of		Other		Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER \$	\$	# of units	\$	Units	\$	\$
A. Land Treatments										
EDRR	acre	1	1400	\$1,400	\$0		\$0		\$0	\$1,400
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$1,400	\$0		\$0		\$0	\$1,400
B. Channel Treatments										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treat.				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
NFSR 10 Clean out	each	1500	1	\$1,500	\$0		\$0		\$0	\$1,500
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Road & Trails				\$1,500	\$0		\$0		\$0	\$1,500
D. Protection/Safety										
Storm Inspection &				\$0	\$0		\$0		\$0	\$0
Response	each	260	4	\$1,040	\$0		\$0		\$0	\$1,040
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Structures				\$1,040	\$0		\$0		\$0	\$1,040
E. BAER Evaluation				\$20,065						
				---			\$0		\$0	\$0
Insert new items above this line!				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				\$20,065	\$0		\$0		\$0	\$0
F. Monitoring										
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals				\$3,940	\$0		\$0		\$0	\$3,940
Previously approved										
Total for this request				\$3,940						

PART VII - APPROVALS

1. _____
Forest Supervisor (signature)

Date

2. _____
Regional Forester (signature)

Date