USDA-FOREST SERVICE FS-2500-8 (6/06)

Date of Report: 07/03/17

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: Bonita

B. Fire Number: NM-CAF-000152

C. State: NM

D. County: Rio Arriba

E. Region: 03 Southwestern Region

F. Forest: 02 Carson NF

G. District: 02 El Rito

H. Fire Incident Job Code: P3K1M5 0302

I. Date Fire Started: June 3, 2017

J. Date Fire Contained: July 3, 2017 (Estimated)

K. Suppression Cost: $5,000,000 (as of July 02, 2017)

L. Fire Suppression Damages Repaired with Suppression Funds
(Suppression Rehab has been initiated but will not be completed until fire is completely controlled or declared out)

1. Fireline waterbarred (miles): 0
2. Fireline seeded (miles): 0
3. Other (identify): N/A

M. Watershed Number:

Canada del Aqua-Rio Tusas	130201021302
Canada Alamosa-Rio Vallecitos	130201021402
Canada de Agua-Rio Vallecitos	130201021403
Canada de los Comanches-Rio Tusas	130201021304

N. Total Acres Burned: 7,495
NFS Acres (7,495) Other Federal (0) State (0) Private (0)

O. Vegetation Types: Ponderosa Pine (5,287 ac), Mixed Conifer - (2,032 ac), PJ Sagebrush woodland (75 ac), Grassland (101 ac)

P. Dominant Soils: Typic Eutroboralfs, Mollic Eutroboralfs, Eutric Glossoboralfs and Typic Dystrochrepts.

Q. Geologic Types: Conglomerate, Sandstone, Meta-sedimentary rocks including Schist, Amphibolite, and Quartzite, Alluvium.

R. Miles of Stream Channels by Order or Class:

Perennial	2.4 miles
Intermittent/Ephemeral	28.5 miles

S. Transportation System

Trails: 0 miles Roads: 31.9 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 4,541 (low) 1,635 (moderate) 170 (high) 1,149 (unburned)

B. Water-Repellent Soil (acres): 1,805

C. Soil Erosion Hazard Rating (acres):
0 (low) 2,770 (moderate) 4,670 (high)

D. Erosion Potential: 3 tons/acre

E. Sediment Potential: 1,706 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

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

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

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 1.77

F. Design Flow, (cubic feet / second/ square mile): 169

G. Estimated Reduction in Infiltration, (percent): 24%

H. Adjusted Design Flow, (cfs per square mile): 407

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The Bonita Fire, located 3 miles north of Cañon Plaza, burned on the El Rito Ranger District of the Carson National Forest. The Bonita Fire was caused by a lightning strike on June 3, 2017, and was initially managed for multiple resource objectives. Due to the increasing complexity of the fire, the Carson National Forest ordered the Southwest Area Type 2 Incident Management Team on June 17, 2017. The Incident management Team took control of the fire on June 19, 2017, and transitioned the management strategy to full suppression. The fire was situated in an area bounded by private property and the Rio Vallecitos to the south and west, by Forests roads 45 and 110 to the east, and Forest Road 42 F to the north.

A Burned Area Emergency Response (BAER) team was assembled by the Carson NF on June 21st, 2017 During the period of June 21st to June 28th, 2017, the team conducted an emergency assessment of post fire resource conditions. Field work was conducted from June 24-27, 2017. On June 29th, 2017 the team presented its findings on burn severity, predicted soil loss, predicted storm runoff, values at risk, and proposed actions to minimize those risks, as well as the likelihood of success of those proposed actions. The findings of that assessment are presented, in part, in this report. The BAER assessment team conducted field surveys during the course of its assignment of the fire in order to identify impacts and compiled recommendations for treatments of the affected resources.

The Bonita BAER Team evaluated Risk to Critical Values per direction in Interim Directive No. 2520-2017-1, Chapter 2523.1 Exhibit 02 and defined the Risk Level to each critical value. The table below details that risk evaluation for critical values at risk on National Forest System (NFS) lands:

Critical Values - Bonita Wildfire			29-Jun-17	
	Probability of Damage or Loss	***Magnitude of Consequence***	***Risk***	***Percent of Fire Area Affecting Risk Rating***
Human Life and Safety				
Risk to Traveling Public (along SH 111)	Unlikely	Moderate	Low	
Risk to Traveling Public within Fire Perimeter/Forest Roads - 42, 274	Likely	Moderate	High	7.5
Property				
NFS Forest Developed Road System	Possible	Moderate	Intermediate	8.5
Natural Resources				
Surface Water Quality - Loss of municipal water supply and agricultural uses (Rio Vallecitos)	Possible	Moderate	Intermediate	24.1
Soil Productivity/Hydrologic function - NFS lands	Likely	Major	Very High	8.5
Invasive Species (Cheatgrass) - expansion of range	Very Likely	Moderate	Very High	8.5
Cultural/Heritage Resources				
Listed/Potentially Eligible - National Register of Historic Places, TCP, Sacred Sites (NFS Lands)	Unlikely	Major	Intermediate	5.2

Reference: Interim Directive (id_2520-2017-1) FSM 2500 Watershed and Air Management, Chapter 2520 Watershed Protection and Management 4/06/2017

Risk to Human Life and Safety: *High Risk to Human Life and Safety* exists to the traveling public within the Bonita Fire perimeter along FDR 42. This risk is based on increased post fire peak flows originating from Moderate and High burn severity in a tributary to Canada del Oso. Post fire peak flow increase from this drainage catchment could be as high as 900 percent above pre-fire peak flow (28 cfs vs. 280 cfs). FDR 42 is situated along the toe slopes and alluvial terraces of Canada del Oso and increased peak flows as modeled could result in flooding of the adjacent stream channel, road damage, and possibility of compromised egress, entrapment, and injury or death of public users of this NFS road.

Risk to Property: *Intermediate Risk to National Forest System Developed Road Prisms and Related Infrastructure* exists within the Bonito fire perimeter. This risk, the result of Moderate and High Burn Severity will likely result in damage to or loss of function of this infrastructure due to increased post fire peak flows, increased soil erosion, and damage to road prisms and drainage structures.

Risk to Critical Natural Resources: *Very High Risk to Soil Productivity and Hydrologic Function and Increased Risk of Establishment and/or Spread of Invasive Species* (cheatgrass) exists within approximately 640 acres of burned area within the Bonita fire perimeter. This risk, the result of Moderate and High Burn Severity, will result in an increase in accelerated soil erosion, loss of long-term soil productivity, and create an environment suited to colonization and spread of an aggressive invasive species, such as cheatgrass, into these areas.

There is also an Intermediate Risk to water quality and use of water downstream of the Bonita fire perimeter for both municipal and agricultural uses. While there is no capability for BAER funds to address these values directly, as those uses occur on private lands, soil stabilization, reduction of erosion and peak flow attenuation from the seeded proposed will indirectly address this concern.

Risk to Cultural and Heritage Resources: *Intermediate risk to cultural resources* in the Canada del Oso drainage exists within the Bonito fire perimeter. This risk, the result of Moderate and High Burn Severity could result in damage to this site, contamination of organic material within the site, and loss of context to a site potentially eligible for the National Register of Historic Places.

B. Emergency Treatment Objectives:

Human Liife and Safety: Protection treatments such as road closure gates, warning signs, and earthen berm construction are proposed to directly address the High Risk associated with this critical value. These treatments will enable the Ranger District to exclude public access to high risk roadway (FDR 42, 42C, 42CT1) during the upcoming monsoon rain season, provide public warning and education of post fire hazards thru installation of warning signs, and exclude travel on a road closed to public travel (FDR 42CT1) by installing a earthen berm to prevent unauthorized access into a large area of Moderate and High Burn Severity.

Property: Preventative measures such as culvert cleaning, brushing culvert inlets/outlets, removal of floatable debris, cutting/opening of cross channel allotment fencing, and storm proofing of roads will increase the likelihood that post-fire peak flows are able to pass thru culverts efficiently and minimize the risk of property damage due to culvert plugging by floatable debris within channels draining areas of High and Moderate Burn Severity.

Natural Resources: Aerial seeding of 640 acres of High and Moderate Burn Severity associated with Mixed Conifer forest type will protect soil resources and site productivity from long term or irreversible damage by restoring ground cover, stabilizing damaged soils, minimizing impacts to water quality and aquatic environments due to increased sedimentation, and reduce the risk of post-fire flood damage by limiting sediment bulking. Mixed conifer sites are the most unlikely forest type to recover naturally from the Moderate and High Burn Severity as the dense canopy cover resulted in higher consumption of the forest litter layer and loss of any residual seed bank that may have existed.

Cultural Resources: No direct treatment of cultural sites are proposed. Aerial seeding in the Canada del Oso tributary area (see treatment map) should help mitigate potential impacts to cultural resources at risk by minimizing the post-fire flood risk and potential scour and channel erosion within and near this site.

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

Land **75** % Channel **90** % Roads/Trails **80** % Protection/Safety **90** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	70	80	90
Channel	80	90	90
Roads/Trails	60	70	70
Protection/Safety	90	95	95

E. Cost of No-Action (Including Loss): $3,415,000

F. Cost of Selected Alternative (Including Loss): $1,237,000

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Greg Miller

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H. **Treatment Narrative:**

Land Treatments: *Aerial Seed approximately 640 acres of moderate and high severity burn in the mixed conifer and pine forest types.*

This treatment is proposed to provide relatively quick establishment of vegetative cover in areas of moderate and high burn severity. There are two objectives associated with this treatment. The first objective of this treatment is the reduction of soil loss rates and aid in slope stabilization. This treatment is expected to reduce hillside erosion and sediment delivery by an appreciable amount and assist in stabilizing burned slopes. Re-establishment of vegetation over the longer term will assist in site stabilization, offering protection to long-term site productivity.

The second objective is to minimize the spread and establishment of cheatgrass in the burned area. There is a relatively high population of cheatgrass in and surrounding the burned area. It has been documented that cheatgrass can be an aggressive invader after disturbances such wildfire. Information pertaining to cheatgrass spread and management was obtained from the Field Guide for Managing Cheatgrass in the Southwest, USDA Forest Service 2016.

The Forest has no current NEPA decision which authorizes chemical control of invasive species. Lacking this management option, seeding as proposed to restore groundcover and offer competition to a species such as cheatgrass, while not a direct treatment such as an herbicide application is thought to be a reasonable alternative at this time.

Water Quality of the Rio Vallecitos, which is currently listed for non-attainment of water quality standards and has a Total Maximum Daily Load (TMDL) for temperature and nutrients/eutrophication will also indirectly benefit from the proposed seeding as nutrient loading due to erosion and sediment delivery will be minimized.

The certified weed free seed mix would be comprised of a quick growing annual non persistent cereal grain and a small percent of high elevation native seeds to give the burned areas a jump start in recovery. From many years of personal experience in the Southwest Region high elevation seeding with annual barley has been proven to be a successful treatment in site stabilization.

Channel Treatments: *Culvert cleaning, culvert inlet/outlet brushing, removal of floatable debris, cutting cross channel fencing.*

Culvert cleaning, brushing culvert inlets/outlets, removal of floatable debris, and cutting/opening of cross channel allotment fencing will increase the likelihood that post-fire peak flows are able to pass thru culverts efficiently and minimize the risk of property damage due to culvert plugging by floatable debris and sediment within channels draining areas of High and Moderate Burn Severity.

Roads and Trail Treatments: *Outslope and waterbar approximately 1 mile of Forest Road 43CT1, install earthen berm to prevent access by the public.*

Forest road 42CT1 traverses the largest area of Moderate and High Burn Severity. It will be subject to erosion and sediment delivery from hill slopes above and is at risk of capturing this increased level of runoff and potentially initiating gulley erosion as a result. Outsloping the affected section of road and placing waterbars at close spacing will help minimize the risk of gulley development as a result of post-fire flows. Installing an earther berm in a suitable location will prevent public access and assist in minimizing the risks to Human Life and Safety.

Protection/Safety Treatments: *Hazard Warning signs at access points on Forest roads 42 and 42C, install 3 metal (locking) gates to restrict access to these Forest Roads subject to risk of flooding and washout, Storm Patrol of these high risk roads.*

All treatments proposed are a direct response to risk identified for Human Life and Safety concern. Forest Roads 42 and 42C should be closed via gates and signage as soon as possible and remain in that status until monsoon rain season has ended (at minimum). Storm Patrol of roads will inform Forest of damage that may occur or has occurred, and guide the District as to whether or not the road should remain closed or if conditions allow for it to be opened safely in the future. It is recommended that this closure be extended, at minimum, into the following year (2018) during monsoon season.

I. Monitoring Narrative:

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

Monitoring proposed include 1) implementation, and 2) effectiveness monitoring.

Implementation monitoring will occur as recommended treatments described above are implemented, along with the cost tracking of these tasks. It should also document any deviation of these treatments (if site condtions warrant).

Effectiveness monitoring will occur post monsoon season and document the success of the treatments as implemented in addressing the risk identified.

As part of effectiveness monitoring, a more detailed means of determining effectiveness of aerial seeding as a means of reducing or retarding the establishment and/or spread of cheatgrass in areas of concern. It is also recommended that this aspect of effectiveness monitoring include seeding success of suppression rehab as a preventtive measure of controling cheatgrass establishment and spread. A detailed monitoring plan for this particular need will be developed and forwarded separately at a later date.

Part VI – Emergency Stabilization Treatments and Source of Funds Initial Request

			NFS Lands				Other Lands			All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
Aerial Seed (fixed wing)	ac	125	638	$79,750	$0		$0		$0	$79,750
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$79,750	$0		$0		$0	$79,750
B. Channel Treatments										
Channel clearing	mi	3000	2	$6,000	$0		$0		$0	$6,000
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$6,000	$0		$0		$0	$6,000
C. Road and Trails										
Stormproof 42CT1	mi	9000	1	$9,000	$0		$0		$0	$9,000
waterbar	ea	500	15	$7,500	$0		$0		$0	$7,500
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$16,500	$0		$0		$0	$16,500
D. Protection/Safety										
Closure gates/install	ea	3500	3	$10,500						$10,500
Hazard Signs	ea	300	2	$600	$0		$0		$0	$600
GS-5 tech	da	200	2	$400	$0		$0		$0	$400
Vehicle	mile	2.5	200	$500						$500
Storm Patrol				$0	$0		$0		$0	$0
GS-Tech	days	200	10	$2,000						$2,000
vehicle/equipment	days	1000	2	$2,000						$2,000
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$16,000	$0		$0		$0	$16,000
E. BAER Evaluation										
				$51,750			$0		$0	$51,750
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$0		$0		$0	$51,750
F. Monitoring										
GS-5 Tech	days	200	30	$6,000	$0		$0		$0	$6,000
vehicle	mile	0.55	750	$413						$413
				$0	$0		$0		$0	$0
Subtotal Monitoring				$6,413	$0		$0		$0	$6,413
G. Totals				$124,663	$0		**$0**		**$0**	**$176,413**
Previously approved										
Total for this request				**$124,663**						

PART VII - APPROVALS

1. James P. Dunn — July 3/2017
   Forest Supervisor (signature) — Date

2. _____ _____
   Regional Forester (signature) — Date