

USDA-FOREST SERVICE

FS-2500-8

Date of Report: **June 23, 2011****BURNED-AREA REPORT**

(Reference FSH 2509.13)

PART I - TYPE OF REQUEST**A. Type of Report**

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

B. Type of Action

- ☒ 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: Duke

B. Fire Number: AZ-CNF-011026C. State: AZD. County: Santa CruzE. Region: 3F. Forest: Coronado National ForestG. District: Sierra VistaH. Fire Incident Job Code: 0305 P3F1N0I. Date Fire Started: 3-20-2011J. Date Fire Contained: 3-31-2011K. Suppression Cost: \$757,000

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): unknown
2. Fireline seeded (miles): None
3. Other (identify): None

M. Watershed Number: HUC 6 watersheds: Canada de la Paloma – Santa Cruz River #150503010303,
Mowry Wash – Santa Cruz River #150503010102, Adams Canyon – Santa Cruz River #150503010104,
Harshaw Creek # 150503010203, Providencia Canyon #150503010301

N. Total Acres Burned: Total 7649 NFS Acres (7484) Other Federal – BLM (0) State (0) Private (165)

O. Vegetation Types: The prominent vegetation type within the fire perimeter consisted of broadleaf evergreen woodlands occurring from 5,000 to 7,000 feet within the fire perimeter. To a lesser extent the fire also included desert grasslands (below 5,000 feet), chaparral communities, and riparian vegetation occurring in

the major drainages. A limited amount of coniferous forests also occur in within the fire perimeter above 7,000 feet.

P. Dominant Soils:

Soil Series	Slope (%)	Rock Outcrop (%)	Surface Soil Texture	Rock Fragments (%)	Erosion Hazard Rating	K-Factor	Hydrologic Group	Acres
BgF - Barkerville-Gaddes association, steep	60	0	Cobbly sandy loam	30	M	0.17	C	2415.7
FrF - Faraway-rock outcrop complex, 30 to 60 percent slopes	60	45	Very cobbly, fine sandy loam	24	H	0.10	D	1805.1
LcF - Lampshire-Chiricahua association, steep	50	0	Very cobbly loam	5	H	0.24	D	1503.1
CmE - Casto very gravelly sandy loam, 10 to 40 percent slopes	40	0	Very gravelly sandy loam	45	M	0.10	D	600.2
FrE - Faraway-Rock outcrop complex, 10 to 30 percent slopes	30	35	Very cobbly, fine sandy loam	24	L	0.10	D	418.9
BaE - Barkerville-Gaddes complex, 10 to 30 percent slopes	30	0	Cobbly sandy loam	30	L	0.17	C	334.9

Q. Geologic Types: The Duke Fire is primarily a complex of granite, granodiorite, with the Eastern portion composed of volcanic rock and conglomerate.

R. Miles of Stream Channels by Order or Class: Intermittent Channels = 19 miles

S. Transportation System

Trails: 0 miles

Roads: 22 miles

PART III - WATERSHED CONDITION

A. Burn Severity by total and FS (acres):

Soil Burn Severity (Acres)	Acres	Percent
High	0	0%
Moderate	524.6	6.9%
Low	3871.3	50.6%
Unburned	3252.9	42.5%

Total	7649	
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B. Hydrophobic Soils: 700 acres. Hydrophobic conditions were inconsistent and are expected to exist in approximately 10% of the fire area or less.

C. Soil Erosion Hazard Rating (acres):

Low	958.5
Moderate	3352.7
High	3337.6

D. Erosion Potential: The erosion hazard rating system used predicts that very few areas will have an increase above natural erosion levels as a result of the fire.

E. Sediment Potential:

Summary of Sediment Yield to HUC 6 Watersheds and other pourpoint watersheds

2 year runoff event

Watershed	Area (Mile ²)	Pre Fire Sediment (yd ³ /mile ²)	Post Fire Sediment (yd ³ /mile ²)	Sediment Increase (x Pre Fire)
1. Providencia Cyn	20.8	520	750	44
2. Mowry Wash	26.3	614	679	11
3. Canada de la Paloma	33.7	514	536	4
4. Adams Cyn	64.3	549	559	2
5. Harshaw Creek	33.1	433	459	5.8

Watersheds may include multiple fires. See soil specialists report.

F. Debris Flow Potential: None to slight potential for debris flows. Slopes are gentle for the most part, especially near structures etc that were identified during the BAER survey. Increased flows from the burned areas may cause increased risk for flooding.

PART IV - HYDROLOGIC DESIGN FACTORS

- | | |
|---|--|
| A. Estimated Vegetative Recovery Period, (years): | understory forbs and grasses 2-3 years
overstory oak woodland 7 – 10 years
overstory coniferous forest 30 – 40 years |
| B. Design Chance of Success, (percent): | <u>90</u> |
| C. Equivalent Design Recurrence Interval, (years): | <u>5</u> |
| D. Design Storm Duration, (hours): | <u>0.5</u> |
| E. Design Storm Magnitude, (inches): | <u>1.62</u> |
| F. Design Flow, (cubic feet / second/ square mile): | <u>92</u> |
| G. Estimated Reduction in Infiltration, (percent): | <u>0</u> |
| H. Adjusted Design Flow, (cfs per square mile): | <u>150</u> |

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

The Duke Fire started on March 20, 2011 and is approximately 7649 acres in size. The fire includes burned areas within the Patagonia Mountains with Providencia Canyon draining to the southeast, a large unnamed drainage draining to the northeast, and another unnamed drainage draining the northwest side through Soldier Basin as the main drainages. There are numerous smaller drainages also draining from the burn area. The Duke Fire burned moderately steep to steep slopes northeast from Duquesne Town. The watersheds are characterized by moderately steep to steep rock armored slopes. Structures were identified around the Mowry House area on private lands that are approx. 1.5 miles downstream and may possibly be subject to flooding of increased flows during storm events depending on storm severity. Some of the house access is across low water crossings and could be an issue during runoff events for access. Recommend signing all roads accessing the burned area warning of increased hazard during storm events. Recommend notifying NRCS to for final risk assessment on private land. The climate is arid overall and precipitation in the fire area is moderate, averaging 19.5 inches per year. Rainfall occurs mostly during the summer months with the monsoons when the potential for intense and localized rainfall can occur. Vegetation consists of woodland forest with an overstory dominated by Oak and Mesquite and also desert grasslands. The fire burn severity was mostly low overall with a few areas of moderate and unburned severity.

Summary of Watershed Response

Hydrologic Response: The Duke Fire has been analyzed by watersheds or pour points different locations in or downstream of the fire area. Watersheds are various sizes and shapes and are dependent on the analysis of the desired outlet or pour point above a value at risk or area of concern. None of these watersheds are expected to have significant increases in post fire water or sediment yield. This is due to the fact that most of the fire had a low burn severity with small pockets of moderate. Larger rain events do have the potential to increase the risk of flooding and sedimentation, though these risks are present with or without the effects of the Duke fire.

Hydrologic design factors used to analyze the effects of the Duke fire considered the vegetative recovery period estimated to be 3-5 years; treatment chance of success is estimated at 90%. Storm recurrence interval of 5 years and 30 minutes using NOAA Atlas 14 for 5-year-30-minute precipitation yielded a design storm magnitude of 1.62 inches of rainfall. Estimated reduction in infiltration was based on the percentage of hydrophobic soil in the burn area which was assessed at 0%. Pre-fire design flow was estimated at 92 cubic feet per second per square mile and post fire design flow was estimated at 150 cubic feet per second per square mile.

Erosion Response: Burn severity is primarily low and moderate. Gentle slopes and hight rock fragment content mitigates erosion. Eroision is expected to be low.

Geologic Response: Fire is located on a geologically stable fan terrace.

Values at Risk

The risk matrix below, Exhibit 2 of Interim Directive No.: **2520-2010-1**, was used to evaluate the Risk Level for each value identified during Assessment:

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High	Very High	Low
Likely	Very High	High	Low

Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

Life: No values at risk were identified.

Property: Based on the estimated watershed response, the BAER Assessment team determined that at least one residence on private property in the Mowry House area are at increased risk to flooding as a result of the Duke Fire. Roads accessing homes in the Mowry House area cross the stream using low water crossings. Forest Roads within the fire area have several low water crossings that may receive some deposition that would need to be cleaned off after storm events but are considered low to moderate risk depending on storm intensity and duration.

Risk Assessment - Private Property

Probability of Damage or Loss: Possible

Magnitude of Consequence: Moderate

Risk Level: Intermediate

Risk Assessment – Forest Roads

Probability of Damage or Loss: Likely

Magnitude of Consequence: Moderate

Risk Level: High

Water Quality and Quantity: No values at risk were identified.

Threats to Soil Productivity: No values at risk were identified. There is no emergency to soil productivity due to the fire-adapted ecosystem, soil type and lack of productive timber stands.

Threats to Cultural Resources: No values at risk were identified.

Threats to Wildlife: No values at risk were identified. The wildlife concerns for the Duke Fire are loss of vegetative cover and foraging habitat.

Threats to Botany: There are no threatened or endangered plants in the fire area. There is no designated critical habitat for plants in the fire area. Invasive species are a risk due to suppression activities; noxious weed detection surveys are recommended.

Native Vegetation Recovery: Ecosystem stability of native plant communities in the Coronado NF is at risk. There is a high possibility of damage to the native plant community from noxious weed invasion. If new infestations are established the magnitude of the consequences would be moderate-to-major. The fire created conditions conducive to the spread of the noxious weeds known to be within or near the fire area. The invasion of exotic vegetation, especially grasses and annual forbs as a result of fires reduces or displaces native plant species, thus impacting native vegetative recovery. Suppression activities have likely vectored noxious weed seed from one or more locations. Vehicles and equipment were not washed prior to entering fire area.

B. Emergency Treatment Objectives

No treatments recommended other than Noxious weed detection surveys and protection of life and property by signing roads and stream access areas to warn forest users of potential threats during storm events. Notify NRCS to evaluate private property.

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

Land N/A % Channel N/A % Roads/Trails N/A % Protection/Safety 90 %

D. Probability of Treatment Success

	1	3	5
Land	n/a	n/a	n/a
Channel	n/a	n/a	n/a
Roads/Trails	n/a	n/a	n/a
Protection/Safety	90%	100%	100%

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

F. Cost of Selected Alternative (Including Loss): N/A

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 checked="" type="checkbox"/> Public Information
<input type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input checked="" type="checkbox"/> BAER coordinator
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input type="checkbox"/> Archaeology	<input type="checkbox"/> NRCS
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	<input checked="" type="checkbox"/> Logistics

Team Leader: Randy WestmorelandEmail: rwestmoreland@fs.fed.usPhone: 530-306-0349 FAX:

Core Team Members:

- Eric Nicita – Soil Scientist
- Curtis Kvamme – Soil Scientist (T)
- Mary Moore – Hydrologist
- Jennifer Bridgewater – Hydrologist
- Jim Schmidt – GIS
- Jason Dierberg – GIS (T)
- Tom Goheen - Logistics
- Marcie Baumbach – Wildlife
- Mike Friend - Botany
- Tim Merten – Roads Engineer
- Rebeca Franco - Information
- Bob Ramirez – Information
- Dave Young - BAER Coordinator

H. Treatment Narrative

The proposed treatments on National Forest System lands are to add to the existing signage and maintain existing signs to make forest users aware of the risk on roads and near stream use areas during storm events.

Land Treatments

Noxious weed detection surveys are recommended. Common invasives to the area are present around the periphery of the fire, but are not currently present in much of the fire area; suppression activities have the potential to have spread invasive seeds to new areas. Reference the specialist report for species of concern and the recommended detection survey plan.

Channel Treatments

None recommended.

Road and Trail Treatments

Warning signs on roads; no known trails.

Protection/Safety Treatments

Add warning signs for flood and debris hazards for road crossings and stream access areas. Maintain existing signs.

I. Monitoring Narrative

None recommended

This report is an initial funding request based on a rapid assessment. If additional treatment needs are identified through more site specific on the ground investigation in cooperation with interested agencies, interim requests for additional funding will be filed. These funding requests will identify the purpose for each treatment, and specific treatment specifications, locations, and number of each treatment.

Part VI – Emergency Stabilization Treatments and Source of Funds

Line Items	Units	Unit Cost	NFS Lands		Other \$	# of units	Other Lands		Total \$
			# of Units	BAER \$			Fed \$	# of Units	Non Fed \$
A. Land Treatments									
				\$0	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Land Treatments</i>				\$0	\$0		\$0		\$0
B. Channel Treatments									
				\$0	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Channel Treat.</i>				\$0	\$0		\$0		\$0
C. Road and Trails									
				\$0	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Road & Trails</i>				\$0	\$0		\$0		\$0
D. Protection/Safety									
Warning signs		300	6	\$1,800	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
				\$0	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Structures</i>				\$1,800	\$0		\$0		\$0
E. BAER Evaluation									
				---			\$0		\$0
<i>Insert new items above this line!</i>				---	\$22,270		\$0		\$0
<i>Subtotal Evaluation</i>				---	\$22,270		\$0		\$0
F. Monitoring									
Noxious weed detection		7160	1	\$7,160	\$0		\$0		\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0
<i>Subtotal Monitoring</i>				\$7,160	\$0		\$0		\$0
G. Totals				\$8,960	\$22,270		\$0		\$0
Previously approved									
Total for this request				\$8,960					

PART VII - APPROVALS

1. /s/ Jim Upchurch
Forest Supervisor (signature)

7/22/2011
Date

2. /s/ C. L. Newman, Jr.
Regional Forester (signature)

7/29/2011
Date

Value at Risk Tool calculations were not performed due to lack of VARs and treatments.

