

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: Duquesne

B. Fire Number: AZ-CNF-011011C. State: AZD. County: Santa CruzE. Region: 3F. Forest: Coronado National ForestG. District: Sierra VistaH. Fire Incident Job Code: 0305 P3F0KZI. Date Fire Started: 2-14-2011J. Date Fire Contained: 2-22-2011K. Suppression Cost: \$174,500

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: Brickwood Canyon – Santa Cruz River #150503010302, San Antonio Canyon #150503010107N. Total Acres Burned: Total 2131 NFS Acres ( 1848) Mexico (283 ) State (0) Private ( 0)

O. Vegetation Types: The prominent vegetation type within the fire perimeter consisted of desert fringe mountain scrub-chaparral communities, with range and valley grasses, and riparian vegetation occurring in the major drainages. Vegetation productivity is low, and vegetation that burned was sparse upon the hillslopes.

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	744.8
LcF - Lampshire-Chiricahua association, steep	50	0	Very cobbly loam	5	H	0.24	D	510.2
BaE - Barkerville-Gaddes complex, 10 to 30 percent slopes	30	0	Cobbly sandy loam	30	L	0.17	C	487.8

Q. Geologic Types: The Duquesne Fire contains a complex of granite, granodiorite, volcanic and metamorphic Rock.

R. Miles of Stream Channels by Order or Class: Intermittent Channels = 7

S. Transportation System

Trails: 0 miles

Roads: 1 mile

### **PART III - WATERSHED CONDITION**

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

Soil Burn Severity (Acres)	Acres	Percent
High	2.7	.1%
Moderate	317.6	14.9%
Low	1570.4	73.7 %
Unburned	240	11.3 %
<b>Total</b>	<b>2131</b>	

B. Hydrophobic Soils: 200 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):

Remaining or missing acres in Mexico were not rated. No soil surveys available.

Low	487.8
Moderate	755.6
High	510.2

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. ERMiT was used to predict sediment delivery to streams as shown below.

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

Watershed	Area (Mile <sup>2</sup> )	Pre Fire Sediment (yd <sup>3</sup> /mile <sup>2</sup> )	Post Fire Sediment (yd <sup>3</sup> /mile <sup>2</sup> )	Sediment Increase (x Pre Fire)
1. Brickwood Cyn	22.6	429	573	33
2. San Antonio Cyn	8.3	209	235	13

F. Debris Flow Potential: Slopes are moderately steep to steep with mostly low and some moderate fire severity. Increased flows from the burned areas may cause increased risk for flooding and potential for debris flows.

## PART IV - HYDROLOGIC DESIGN FACTORS

- |   |   |
|---|---|
| A. Estimated Vegetative Recovery Period, (years):   | understory forbs and grasses 2-3 years<br>overstory oak woodland 7 – 10 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>1.41</u>   |
| F. Design Flow, (cubic feet / second/ square mile): | <u>130</u>  |
| G. Estimated Reduction in Infiltration, (percent):  | <u>0</u>  |
| H. Adjusted Design Flow, (cfs per square mile):     | <u>168</u>  |

## PART V - SUMMARY OF ANALYSIS

**A. Describe Critical Values/Resources and Threats:**

The Duquesne Fire started on February 14, 2011 and is approximately 2131 acres in size. The burned area drains the western slope of the southern end of the Patagonia Mountains. The southern end of the burn straddles the Mexican border. The Duquesne Fire burned moderately steep to steep areas east of Nogales. The watersheds are characterized by moderately steep to steep rock armored. No values at risk were identified within the Duquesne fire area except for the Sierra Tordilla well site. 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 desert fringe mountain scrub-chaparral communities, with range and valley grasses, and riparian vegetation occurring in the major drainages. Vegetation productivity is low, and vegetation that burned was sparse upon the hillslopes. The fire burn severity was mostly low overall with a few areas of moderate or unburned severity.

## **Summary of Watershed Response**

**Hydrologic Response:** The Duquesne Fire has been analyzed by watersheds or pour points at 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 Duquesne fire.

Hydrologic design factors used to analyze the effects of the Duquesne fire considered the vegetative recovery period estimated to be 3-5 years; treatment chance of success as 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 1.41 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 130 cubic feet per second per square mile and post fire design flow was estimated at 168 cubic feet per second per square mile.

**Erosion Response:** Burn severity is primarily low and moderate. Erosional pavement consistent of cobbles and stones armoring surfaces from erosional processes. Erosion from fire is expected to be low.

**Geologic Response:** Fire area consists of geologically stable bedrock.

## **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 and Property:** Based on the estimated watershed response and terrain, the BAER Assessment team determined there are no significant values at risk as a result of the Duquesne Fire. 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: Unlikely

Magnitude of Consequence: Minor. This determination was made based on the minimal change in watershed response.

Risk Level: Very Low.

### Risk Assessment – Forest Roads

Probability of Damage or Loss: Unlikely

Magnitude of Consequence: Major

Risk Level: Intermediate

#### Risk Assessment – Sierra Tordilla Well

Probability of Damage or Loss: Possible – near a right angle turn in a confined channel – at risk of the alluvial terrace being scoured away beneath the site if flows are largely elevated.

Magnitude of Consequence: Moderate to Major – only local water source in a large vicinity.

Risk Level: Intermediate to High – Propose putting in boulder rip-rap to protect well and stream bank

Water Quality and Quantity: No values at risk. The most noticeable post fire effects on water quality would be increased sediment and ash from the burned area into drainages and waterbodies in and downstream of the fire area. During storm events this will increase turbidity and contribute to pool filling. Due to the low burn severity, water quality and quantity is not expected to be significantly affected as a result of the Duquesne Fire (see Hydrology Specialist Report, BAER Assessment Project File).

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

Threats to Cultural Resources: No values at risk.

Threats to Wildlife: The wildlife concerns for the Duquesne Fire are loss of vegetative cover and foraging habitat.

#### Risk Assessment – Wildlife

Probability of Damage or Loss: Unlikely

Magnitude of Consequence: Moderate

Risk Level: Low

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.

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**

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 is recommended. Notify NRCS to evaluate private property. Install boulder rip-rap to protect well.

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

Land \_\_\_ % Channel \_\_\_ % Roads/Trails \_\_\_ % Protection/Safety \_\_\_ %

**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	n/a	n/a	n/a

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.us](mailto:rwestmoreland@fs.fed.us)Phone: 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 treatments listed below are those that are considered to be the most effective on National Forest System lands given the local setting including topography and access.

**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.

Install boulder rip-rap to protect Sierra Tordilla Well.

**Channel Treatments**

None recommended.

**Road and Trail Treatments**

Road: Flash Flood Warning Signs. No known trails.

## **I. Monitoring Narrative**

None

### **Recommendations**

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

		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										
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$0	\$0		\$0		\$0	\$0
B. Channel Treatments										
Boulder Rip Rap Tordilla Well protection		6000	1	\$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										
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Road & Trails				\$0	\$0		\$0		\$0	\$0
D. Protection/Safety										
Warning Signs		300	2	\$600	\$0		\$0		\$0	\$600
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Structures				\$600	\$0		\$0		\$0	\$600
E. BAER Evaluation										
				---			\$0		\$0	\$0
Insert new items above this line!				---	\$6,200		\$0		\$0	\$6,200
Subtotal Evaluation				---	\$6,200		\$0		\$0	\$6,200
F. Monitoring										
Noxious Weed Detection		2100	1	\$2,100	\$0		\$0		\$0	\$2,100
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$2,100	\$0		\$0		\$0	\$2,100
G. Totals				\$8,700	\$6,200		\$0		\$0	\$14,900
Previously approved										
Total for this request				\$8,700						

### PART VII - APPROVALS

1. /s/Jim Upchurch 7/25/2011  
Forest Supervisor (signature) Date

2. /s/Clifford J. Dils, (for) 7/28/2011  
Regional Forester (signature) Date



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