West Government Creek Fire
September 2016

Photo by BAER Team Leader, Brendan Waterman

Date of Report: October 14, 2016

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: West Government Creek

B. Fire Number: UT-UWF-000771

C. State: UT

D. County: Tooele

E. Region: 04

F. Forest: Uinta-Wasatch-Cache

G. District: Spanish Fork

H. Fire Incident Job Code: P4KPB016-0419

I. Date Fire Started: September 2, 2016

J. Date Fire Contained: 9/22/16

K. Suppression Cost: Est. $1.0 million as of 9/22/16.

L. Fire Suppression Damages Repaired with Suppression Funds
1. Dozerline rehabbed (miles): 9
2. Handline rehabbed (miles): 0.5

M. Watershed Numbers and Percentage Burned

5th Field Sub-Watershed	HUC Number	Total Acres	Acres Burned	Percent Burned
Upper Government Creek	160203061003	37,700	4,158	11%
East Faust Creek	160203040104	35,856	79	0.2%
Valley Reservoir	160203050101	37,185	8	0.02%

N. Total Acres Burned:

Land ownership	Acres burned	Percent of burned area
USFS	3139	74%
BLM	1106	26%

0. Vegetation Types
Pinyon-Juniper, Sagebrush, Grasses, Forbs

P. Dominant Soils
2 – Abela very gravelly loam, 5 to 15% slopes; 35 – Kapod very cobbly loam, 5 to 30% slopes; 38 – Lodar-Lundy-Rock outcrop assoc, 30 to 60% slopes; 47 – Podmor-Onqui-Rock outcrop assoc, 20 to 60% slopes; 48 -Reywat-Broad-Rock outcrop assoc, 30 to 60% slopes

Q. Geologic Types: Prospect Mountain, Tintic, Ignacio, Geertsen Canyon and other Fms; alluvial deposits of Miocene and Pleistocene age

R. Miles of Stream Channels by Order or Class:

0.0 miles perennial. 16.6 miles intermittent

S. Transportation System
Trails: 0.0 miles Roads: 5.3 miles (NFS)

PART III - WATERSHED CONDITION

A. Soil Burn Severity for the Whole Burned Area – BLM and USFS (acres):

Severitv	Acres Burned	Percent
Hioh	80	1.9%
Moderate	1701	40.1%
Low	2054	48.4%
Unburned	409	9.6%

SBS map (Figure 1) can be found at end of 2500-8.

B. Water Repellent Soils and Increased Runoff: Water repellent soils were estimated to occur on 250 acres of the burned area. This accounts for all of the high soil severity and 10% of the moderate.

Increased runoff due to assumed hydrophobic conditions is reflected in the peak flow analysis. Increased overland flow due to the hydrophobic conditions may increase hill-slope rill and sheet erosion in areas where significant amounts of ground cover were consumed. When present, hydrophobic layers will usually take six months to two years to break down. Plant root development, soil microbial activity, and freeze-thaw cycling all contribute to the degradation of hydrophobic conditions.

C. Soil Erosion Hazard Rating for burned areas on NFS lands:

Erosion Hazard Rating	Acres
Slight	377
Moderate	951
Severe	1,815

D. Erosion Potential

The average erosion potential value for the burn scar is estimated at 8 to 14 tons/acre.

E. Sediment Potential: 5120 to 8960 cubic yards/square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):

8. Design Chance of Success, (percent): 60%

C. Equivalent Design Recurrence Interval, (years): 10

D. Design Storm Duration, (hours): *1*

E. Design Storm Magnitude, (inches): 0.918

F. Design Flow, (cubic feet / second/ square mile): 25.3

G. Estimated Reduction in Infiltration, (percent): 5.9%

H. Adjusted Design Flow, (cfs per square mile): 78.5

Pre and post-fire peak flow predictions from Wildcat Rainfall-Runoff Hydrograph Model

Watershed	Unburned/ Low	Moderate	High	Total	Pre-fire Qp (cfs)	Post Fire Qp (cfs)
Log Canyon	621	610	43	1,274	56	157

PART V - SUMMARY OF ANALYSIS

Introduction/Background:

The lightning caused West Government Creek Fire started on September 2, 2016. As of September 22, the fire had burned approximately 4,245 acres and was 100% contained. Soil burn severity was generally low on the lower angle slopes near the valley floor that were vegetated with sagebrush, moderate on the steeper slopes that were vegetated with Pinyan Juniper, and high in the conifer stringers surrounding Red Pine Mountain.

A. Describe Critical Values/Resources and Threats:

The BAER team began assessing the area for post-fire emergencies on September 8, 2016. The team has identified the following values at risk and post-fire threats. Interim reports may be submitted as additional assessments are completed and/or the need to repair or maintain BAER treatments emerges.

The risk matrix below, Exhibit 2 of Interim Directive No.: 2520-2015-1 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

1) Human Life and Safety: Potential threats to Forest visitors and agency personnel include hazard trees, flooding, and debris flows along NFS roads.

   Low Risk (Unlikely probability; Moderate consequence) to human life and safety of forest visitors and agency personnel when traveling on NFS roads within the burn scar during storm events. Very few routes cross channels within the burn scar on NFS lands. Hazard tree threats along roads are limited to a few isolated spots where burned mature juniper is located directly adjacent to the road prism. Treatments are not recommended.

2) Property: Potential threats to NFS roads within the burn scar exist along the Copper Spring road (787). This road crosses 2 ephemeral drainages, Log Canyon and an unnamed drainage to the south of Log Canyon.

   Low Risk (Possible probability; Minor consequence) that the crossings could be impacted by flash flooding or debris flows. Both crossings are unimproved. There is very low potential for the channels to be captured by the motorized routes. Channel scour during flash flood events could leave short sections of the road impassable if gullies are cut through the existing route. Treatments are not recommended .

3) Natural Resources: Potential loss of soil due to post fire runoff events and change in native plant community. Following the wildfire, erosive conditions exist due to the burning of ground cover, coarse woody debris and soil subsurface organic material. Loss of topsoil negatively affects ecological function for the native seed bank, native species recovery potential, root growth, and soil stability. With BARC imagery and on the ground assessments and verification the BAER team concluded that 52% of this

incident was subjected to Moderate and High Severity Burns. Approximately 79 acres were mapped as high burn severity and 1,542 acres burned at moderate severity. Due to the lack of ground cover there will likely be an increase in surface runoff and erosion during typical summer monsoon rain events.

Very High Risk (Likely probability; Major consequence). Emergency post-fire seeding treatments are being proposed in cooperation with the State of Utah Division of Wildlife resources. This treatment is expected to mitigate the current the threat to soil productivity by re-establishing the native plant community and reducing the potential for accelerated hillslope erosion.

4) **Natural Resources:** Potential threats to native or naturalized communities on NFS lands where invasive species or noxious weeds are absent or present in only minor amounts exist on NFS lands within the burn perimeter. In many locations within the burn area the native plant community is not expected to return following the fire due to competition from cheatgrass. These include areas that were dominated by sagebrush or pinyon juniper vegetation. Pre fire understory grass and forb species were low in number in these areas and will not provide adequate amounts of plant densities to out compete cheat grass.

On lands adjacent to NFS lands, along roads leading to NFS lands, and on NFS lands there are known infestations of Cheatgrass, (Bromus tectorum). In several unburned areas outside the fire area at lower elevations, cheatgrass was observed. Within the fire area, cheatgrass was also noted as present, but no extensive infestations were seen in unburned areas that were reviewed on-the-ground.

Of greatest concern are existing infestations located within or very near the fire perimeter, as it is very likely that these existing infestations could expand and they also provide a readily available seed source. Cheatgrass is known to invade and rapidly establish within burned areas.

The risk is a very high for this invasive grass to invade the fire area where no existing infestations are located, particularly in lower elevations, (below 6200 feet), on NFS lands and on adjacent low elevation BLM lands. Suppression ground disturbance such as dozer lines also provide opportunity for cheatgrass to invade.

Cheatgrass spreading further from existing infestations and invading into burned areas where no infestations currently exist is very likely and is an emergency situation caused by the West Government Fire.

On lands adjacent to NFS lands, along roads leading to NFS lands, and on NFS lands there are known infestations of Squarrose knapweed. Of greatest concern are existing infestations located in or very near the fire perimeter, due to the potential for further spread, and the readily available seed source. Knapweeds are also known to establish rapidly in disturbed areas, such as the dozerlines that were constructed during suppression, and have been known to rapidly invade burned areas.

There are isolated mapped infestations of Whitetop (Cardaria draba), located within the fire perimeter. It is possible that these existing infestations could expand if left untreated. The risk of increased infestations of this species is possible due to this existing population and seed source within the fire perimeter.

Very High Risk (Very Likely probability; Major consequences) Emergency seeding treatment with a native grass mix is being requested, as establishment of additional native perennial grasses will provide much needed competition against the very high risk and likelihood of rapid invasion of cheatgrass into uninfested areas of the burn and further spread of existing infestations. Seeding will reduce the likelihood that cheatgrass will become a dominant component of the burn area vegetation.

High Risk (Likely probability; Moderate consequence) Emergency Early Detection Rapid Response treatments for noxious and invasive weeds are being requested due to the high risk of invasion into uninfested areas.

5) Cultural and Heritage Resources: Two NRHP eligible sites were identified during the BAER assessment. Potential threats to these sites include loss due to post-fire erosion and deposition and looting due to loss of pre-existing ground cover.

Low Risk (Unlikely probability; Moderate consequence). Treatments are not recommended.

B. Emergency Treatment Objectives:

1. **Ecological integrity** - Reduce the potential for impaired vegetative recovery and introduction/spread of invasive weeds by conducting detection surveys and rapid response eradication efforts where feasible.

2. **Ecological integrity/ Soil productivity –** Reduce the potential for Cheatgrass invasion into uninfested areas and subsequent loss of native grass communities and soil productivity by aerially seeding aggressive native grasses onto areas that experienced moderate burn severity.

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

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

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	75%	75%	75%
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): $241,894

Assumes total cheatgrass treatment cost of $322/acre on low angle, moderate severity areas (727 acres) and total noxious weed treatment cost of $7,800 for spot treatments at locations identified during BAER survey.

F. Cost of Selected Alternative (Including Loss): $121,674

Assumes cheatgrass treatment implementation cost of $56,570 with a 75% success rate that would result in follow up treatments totaling $58,604 ($322/acre*182 acres) as well as noxious weed initial EDRR treatment cost of $2,600 plus follow up treatments totaling $3,900.

G. Skills Represented on Burned Area Survey Team:

[x] Hydrology	[x] Soils	[ ] Geology	[ ] Range	[ ] Liaison
[ ] Forestry	[ ] Wildlife	[ ] PIO	[ ] Engineering	[] Trails/Recreation
[ ] Contracting	[ ] Ecology	[x] Botany	[x] Archaeology	[ ] NOAA/NWS
[ ] Fisheries	[ ] Research	[ ] Landscape Arch	[ ] GIS	

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H. Treatment Narrative:

(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

1) Land Treatments

Noxious Weed Detection and Eradication Treatments

Detection and eradication treatments will occur:

- Where disturbances from suppression efforts such as bulldozer lines and staging areas created openings for noxious weeds to establish and/or spread and impede or prevent recovery of desirable vegetation
- Burned and/or disturbed areas adjacent to or downstream of existing weed infestations. Currently there are weed infestations out of the burn area that are known and/or have been historically treated.

Item	Unit	Unit Cost	# Units	Total
2 Person Crew	Days	$300	7	$2,100
Herbicide/Equipment	Each	$500	1	$500
				$2,600

Aerial Seeding Treatments

Aerial seed application of 727 acres of the high and moderate severity burn areas of the West Government Creek Fire. Funding is requested to purchase and apply competitive native grasses to these areas in an effort to reduce the threats of cheatgrass invasion, loss of soil productivity, and accelerated erosion.

This treatment would be done in cooperation with the Utah Division of Wildlife Resources (DWR), who have have submitted a post-fire rehabilitation proposal to restore Greater Sage Grouse habitat by seeding a variety of grasses, forbes, and shrubs throughout a larger portion of the burn area. The DWR project would involve seeding on all burned ground (SLM and NFS lands) that can be one-way chained after the seed is applied. This larger treatment area consists of the lower angle slopes on the western half of the burn scar.

Item	Unit	Unit Cost	# Units	Total
Native Grass Seedmix	lbs	$6.68	3816.75	$25,490
Aerial application, mobilization, seed transfer	Acre	$40	727	$29,080
Seeding Inspection (GS-11 Botanist)	Days	$400	5	$2,000
				$56,570

West Government Creek Fire BAER - Initial Request and Approval

			NFS Lands				
		Unit	# of	Request	Not Approved		Approved
Line Items	**Units**	**Cost**	**Units**	**BAER $**	$		$
A. Land Treatments							
2 Person Weeds Crew	Days	$300.00	7	$2,100			
Treatment Chemical/Equipment	Each	$500.00	1	$500			
Native Grass Seedmix	lbs	$6.68	3816.75	$25,490			
Aerial Application, mobilization, transfer	Acre	$40.00	727	$29,080			
Seeding Inspection (GS-11 Botanist)	Days	$400.00	5	$2,000			
Subtotal Land Treatments				**$59,170**			**$0**
B. Channel Treatments							
None Proposed							
Subtotal Channel Treat.				**$0**			**$0**
C. Road and Trails							
None Proposed							
Subtotal Roads and Trails				**$0**			**$0**
D. Protection and Safety Treatments							
None Proposed							
Subtotal Protection and Safetv				**$0**			**$0**
E. lmplemenatation Support							
None Proposed							
Subtotal Support				**$0**			**$0**
F. BAER Evaluation							
Assessment	Team	$12,453	1	---			
Subtotal Evaluation				---			
G. Monitoring							
None Proposed				$0			$0
Subtotal Monitoring				**$0**			**$0**
H. Totals				**$59,170**			**$59,170**

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PART VII • APPROVALS

Forest Supervisor (signature)

10/14/16
Date

2. */s/ Mary Farnsworth (for)*
Regional Forester (signature)

10/19/16
Date

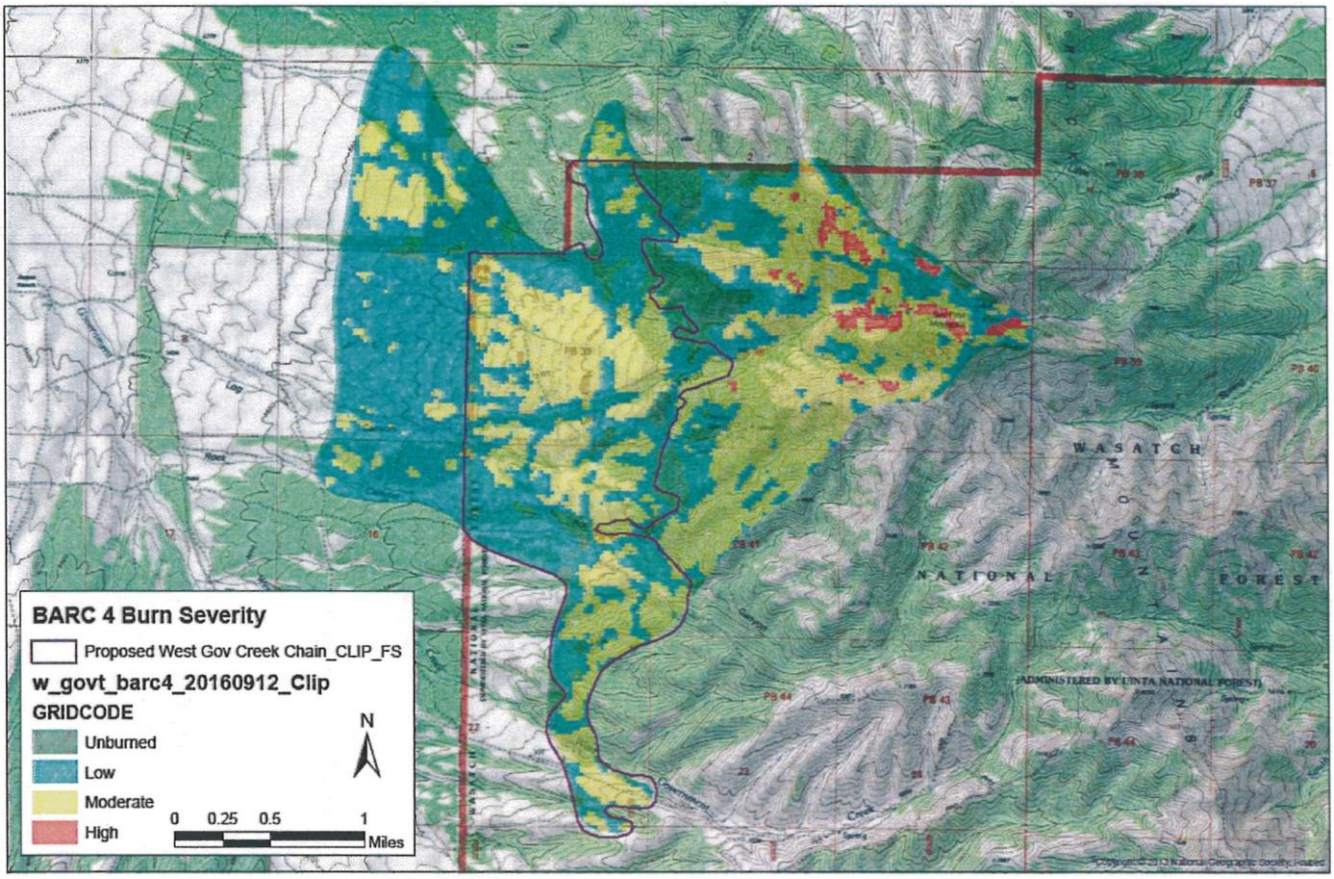

Figure 1: Soil Burn Severity Map with seeding/chaining proposal boundary. BAER funds would be used to support DWR seeding of grasses in Moderate Severity areas (yellow) inside chaining/seeding boundary (purple).