07/23/2020

BURNED-AREA REPORT

PART I - TYPE OF REQUEST

A. Type of Report

☒ 1. Funding request for estimated emergency stabilization funds

☐ 2. No Treatment Recommendation

B. Type of Action

☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

☐ 2. Interim Request #___

☐ Updating the initial funding request based on more accurate site data or design analysis

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Canal Fire

B. Fire Number: UT-FIF-200263

C. State: UT

D. County: Millard & Juab

E. Region: Intermountain/R4

F. Forest: Fishlake

G. District: Fillmore

H. Fire Incident Job Code: PNM7RM/1502

I. Date Fire Started: 06/26/2020

J. Date Fire Contained: 100% as of 07/11/2020

K. Suppression Cost: $6,800,375 as of 07/16/2020

L. Fire Suppression Damages Repaired with Suppression Funds (estimates): $38,000

Fireline repaired (miles):

Dozer line:2.8 miles , Roads: 1.7 miles, Handline: 1.0 miles

M. Watershed Numbers (FS Only):

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% Watershed Burned
160300051202	Leamington Canyon-Sevier River	32,187	1,633	5.1
160300050406	Wringer Canyon-Sevier River	30,006	4,630	15.4
160300051201	Fool Creek Reservoir-Fool Creek	34,369	14,702	42.8
160300050404	Wide Canyon	13,416	3,478	25.9
160300051505	Oak Creek Sinks	34,701	571	1.6

HUC #	Watershed Name	Total Acres	Acres Burned	% Watershed Burned
160300051504	Lower Oak Creek	10,125	445	4.4

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	25,459
BLM	20,870
STATE	3,304
PRIVATE	28,390
TOTAL	78,023

O. Vegetation Types: The fire started at the sagebrush, perennial grass zone, rising into the mountain brush, mahogany and Gambel oak. Then it swept through the remaining pinyon-juniper zone that was either dead skeletons from previous fires or the small remaining stands of live trees.

P. Dominant Soils: Soils within the burned area are located on slopes ranging from 5 to 70 percent. Soils are generally shallow (less than 20in) and moderately well drained due to high rock fragment contents (many are skeletal) with loamy to sandy loam textures throughout. Soils located in some of the gentler sloping alluvial fans can be very deep, well drained yet still meeting skeletal criteria for rock fragments often barely meeting (or falling short of) Mollisols.

Q. Geologic Types: Tinitic Quartzite, Maxfield Limestone, Indianola Conglomerate, Precambrian Rocks, Alluvium and Colluvium, Salt Lake Sediments.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERRENIAL	none identified
INTERMITTENT	102
EPHEMERAL	none identified
UNCLASSIFIED	9

S. **Transportation System (NF):**
Trails (motorized): *(miles):* 2
Trails (non-motorized): *(miles):* 2
Roads: *(miles):* 25

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	BLM	State	Private	Total	% within the Fire Perimeter
Unburned	4,971	5,169	806	10,340	21,286	27%
Low	4,415	6,029	1,057	6,353	17,854	23%
Moderate	15,250	9,538	1,436	11,330	37,554	48%
High	823	135	4	367	1,329	2%
Total	25,459	20,871	3,304	28,390	78,023	100%

B. Water-Repellent Soil (acres): Hydrophobicity was difficult to detect across all burn severities. Where hydrophobicity did occur, it was categorized as Shallow & Weak. Many of the soils in the burned area have

very little organic matter (Soil Organic Carbon) to volatize the hydrocarbons out of and onto soil particles resulting in a hydrophobic layer.

C. Soil Erosion Hazard Rating: Soils characterized as Moderate and High soil burn severities are anticipated to have a high soil erosion hazard rating due to the observed loss of roots, soil structure and any existing litter or ground cover. 16,073 acres or 63% of the total Forest Service burned area.

D. Erosion Potential: 7 tons/acre in the first year following the fire with no treatment

E. Sediment Potential: 4982 yds^3/mi^2 in the first year following the fire with no treatment

F. Estimated Vegetative Recovery Period (years): Due to the short fire cycle of this area, the existing plant species regenerate from root sprouting. With moderate precipitation in the next two years, the plants that survived the fire and the newly seeded species will be stable and growing. Within one year, due to the lower severity of the overall burn, most plants will be recovered enough to provide soil stability and use for ungulates and wildlife.

F. Estimated Hydrologic Response (brief description):

The primary watershed responses of the Canal fire are expected to include: 1) an initial flush of ash and debris, 2) erosion on steep slopes within the burned area, and 3) potential floods and debris flows during summer monsoonal precipitation events (July –September). Due to the high fire return frequency of the affected area, and lack of Pinyon-Juniper reestablishment after previous fires, vegetation coverage consists of a primarily grass and shrub dominate system. The low amount of coarse woody fuel and standing trees has resulted in a generally low to moderate burn severity. It is expected that summer monsoonal precipitation events will result in floods that are capable of delivering debris flow to downstream users. Flood events are also expected to pose flood and erosion risks to existing NFS roads and trails. These hydrologic responses are expected to be most pronounced within the first several years following the fire and will become less evident over time as vegetation and soil-hydrologic function recover. Predicted post-fire peak discharge for the 2-year storm event are on average over 300 (ft^3/s) greater than pre-fire conditions, and over 1000 (ft^3/s) greater for a 10-year storm. Post fire debris flows, and floods pose a significant threat to National Forest Service (NFS) road systems, channel stability, and downstream (non-NFS) infrastructure. Post fire floods also pose a risk to human life and safety. Storm Patrols will be necessary to protect NFS values at risk and implementing early flood warning systems could significantly mitigate risks to human life and safety.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Canal Fire was started by lightening off Forest and burned onto the Forest after a very high wind event. All of the area burned in the Canal Fire on NFS lands burned in the Clay Springs Fire (2012) with portions of the Canal Fire having burned in other smaller wildfires since 2012. Repeated fire activity has resulted in a shift of vegetative communities away from large, contigous areas of juniper to an open grass, oak shrub dominated landscape. Some of the remaining pockets of juniper were consumed in the Canal Fire, but primarily the fire burned across non-timbered areas.

A. Describe Critical Values/Resources and Threats (narrative):

Much work has been done in the area from previous BAER funds. Some of the previous BAER investments need to be improved/armored for much of the same reason they were originally installed. As a result of a short fire return interval, much of the area is not forested (small areas of Juniper exist), nor is

there a high amount of downed coarse wood. The low timber quantity and lack of woody fuel load has resulted in the majority of the burned area to be dominantly comprised of grasses and shrubs that burned primarily in a moderate soil burn severity class, with areas of low to unburned soil burn severity. These are the highest burn severities achievable from this vegetative communities.

Table 5: Critical Value Matrix

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 (HLS):**
   Public Users fo FS Roads & Trails: Warning Signs & Storm Patrols
   - Probability of Damage or Loss: Possible + Magnitude of Consequence: Major = Risk: High

2. **Property (P):***FS System Roads:* Road Armoring (Fords) & Drainage Installation

   FS System Trails: Trail & Stream Crossings Armoring & Drainage Installation

   - Probability of Damage or Loss: Very Likely + Magnitude of Consequence: Moderate = Risk: Very High

3. **Natural Resources (NR):***Soil Productivity, Hydrologic Function, Native & Naturalized Plant Communities:* Aerial Seeding & Noxious Weed Treatments

   - Probability of Damage or Loss: Very Likely + Magnitude of Consequence: Major = Risk: Very High

   Minor Facilities & Infrastructure: Forest Signs, Road signs, Interpretive Heritage Sign & Fences

   The Pilot Project request form has been completed and added as an addendum to this 2500-8 requesting funds to replace road signs, Forest portal signs, 1 Interpretive Heritage sign and fences that were burned. Requirements for funding approval will accompany that request.

B. Emergency Treatment Objectives:

Human Life and Safety (HLS):
Public Users fo FS Roads & Trails: Warning Signs & Storm Patrols

We are requesting funding for "Burned Area Ahead" (or similar) warning signs (materials & labor) to be placed at the main Forest entrances & thru-ways notifying the public of potential hazards resulting from the fire.

Property (P):*FS System Roads:* Road Armoring (Fords) & Drainage Installation

FS System Trails: Trail & Stream Crossings Armoring & Drainage Installation

We are requesting funding (materials & salary) to armor and improve drainage on strategic NFS roads and trails in the burned area. Armoring and improving drainage on NFS roads and trails would reduce the threat of significant erosion or total washouts during heavy flow events. Since the area burns at a high frequency, not all roads and trails within the burned area require treatment. Some of the NFS roads & trails are believed to be able to withstand post fire watershed events due

to previous BAER investments. Storm patrol funding is requested to respond to flood incidents, as needed, in lieu of, upsizing multiple culverts. Patrolling during rain events and responding with equipment, when necessary, is a more cost effective option.

Natural Resources (NR): *Soil Productivity, Hydrologic Function, Native & Naturalized Plant Communities:* Aerial Seeding & Noxious Weed Treatments

We are requesting funding to complete aerial seeding to stabilize soils, mitigate cheat grass invasion, and protect the integrity of native and naturalized plant communities on recently burned hillslopes. The Utah Division of Wildlife Resources (UDWR) has contacted the Forest Service, BLM, and State and Private landowners to partner with them to identify a seed mix required by each landowner. Additional seed may be provided by the UDWR to meet long term objectives for the area. This robust seed mix would further increase the effectiveness of the requested hillslope treatment by increasing plant diversity and increasing long term cover Partnering with UDWR would reduce costs and provide benefits to the landscape beyond the scope of BAER (i.e. wildlife forage).

We are requesting funds to detect, treat emerging noxious weeds and monitor treatment effectiveness. Monitoring would analyze the effectiveness of treatments within the burned and suppression disturbance area. Funds requested would be used for treatment supplies (i.e. herbicide) and salaries to conduct treatments and monitoring.

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

Land: 65%
Roads/Trails: 85%
Protection/Safety: 90%

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land (aerial seeding)	60%	70%	75%
Land (weed treatment)	80%	70%	70%
Roads/Trails	85%	85%	85%
Protection/Safety	90%	90%	90%

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

The values at risk directly lost through No-Action includes;

- Human Life and Safety – Signs
  - People unfamiliar with local conditions entering the burned area. The burned area is very popular for hunters in the fall. They may be in danger of roads washing out or access being blocked out of the fire area.
  - Closure of the area is not appropriate because the threat only exists during infrequent weather events

- Property – Road and Trail Armoring
  - Significant damage to roads and trails very likely resulting in the Forest having to undertake much more reconstruction of the road and trail prisms
  - Loss of soil productivity and hydrologic function due to extensive erosion for which there is no replacement

- Natural Resources – Aerial seeding & Noxious Weed Treatment
  - Without aggressively addressing bare and exposed soils, noxious weed and invasive exotics including cheat grass will expand into sites previously dominated by native plant

communities. Knowledge and research surrounding the detriments of this to soil productivity, hydrologic function and other non-BAER values (wildlife forage, general ecology, etc.) are widely available. Once infested with non-native undesirable plants, treatments to reestablish desirable species are nearly impossible.

- Additionally, the Fishlake NF has a great relationship with local County, State and other Federal Agencies that allow for additional seed species to be applied, broader governmental efficiencies to be gained, at cheaper costs and partnerships to be fostered. These partnerships help meet both emergency as well as rehab and restoration objectives at the same time.

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

☒ Soils	☒ Hydrology	☒ Engineering	☒ GIS	☒ Archaeology
☒ Weeds/Range	☒ Recreation	☒ Fisheries	☐ Wildlife	☒ Ecology

Team Leader(s):
Doug Robison (Lead) **Email:** douglas.robison@usda.gov **Phone** 435-896-1019
Dave Marr (Assistant) **Email:** david.marr@usda.gov **Phone** 208-557-5782

Forest BAER Coordinator: Stan Anderson
Email: stan.anderson@usda.gov **Phone** 435-896-1050

Team Members: *Table 7: BAER Team Members by Skill*

Skill	Team Member Name
Team Lead(s)	Doug Robison, Dave Marr
Soils	Dave Marr
Hydrology	Michael Damman
Engineering	Garon Sandall
GIS	Maggie Toone
Archaeology	Chuck Hutcheson
Weeds/Range	Lannce Sudweeks
Recreation	Doug Robison
Ecology	Kelly Memmott
Fisheries	Jens Swensen

H. Treatment Narrative:

Protection/Safety Treatments:
Funds requested for Protection/Safety Treatments are as follows to reduce the threat of to Critical BAER values; Human Life and Safety:

Canal BAER Human Life & Safety Treatments

Treatment	Need	Cost	Quantity	Unit of Measure	Total
Sign Installation	GS-5	$ 250	2	days	$500
Warning Signs	at portals	$ 250	4	each	$1,000
Installation Supplies	posts, etc.	$ 500	1	each	$500
					$0
				Total	**$2,000**

Signs would be installed at the main portals that provide the most heavily used access into the burned area.

The National Weather Service is working with the Forest Service, Millard County Sheriff's Office, and Local Communities to determine if an emergency warning system should be installed through the NWS process and funding. No BAER funds are requested for this action.

Land Treatments:

Funds requested for Land Treatments are as follows to reduce the threat of impact to Critical BAER values; Native & Naturalized Plant Communities, Soil Productivity and Hydrologic Function:

Canal BAER Land Treatments

Treatment	Need	Cost	Quantity	Unit of Measure	Total
Weed Treatment	GS-11	$36	24	cost/hour	$864
Weed Treatment	GS-5	$16	160	cost/hour	$2,560
Weed Treatment	Herbicide	$35	644	cost/acre	$22,540
Weed Treatment	Equipment Use	$350	1	cost/job	$350
Weed Treatment	FS Vehicles	$1	1250	cost/mile	$1,250
Weed Treatment	PPE	$300	1	cost/job	$300
				Weed Trmt Total	**$27,864**
Aerial Seeding	GS-11 Contract Pre	$36	60	cost/hour	$2,160
Aerial Seeding	GS-11 Seed testing	$36	30	cost/hour	$1,080
Aerial Seeding	Vehicle Miles	$1	1000	cost/mile	$610
Aerial Seeding	Seed purchase	$101,303	1	cost/job	$101,303
Aerial Seeding	Aerial Application	$35	2059	cost/acre	$72,065
					$0
				Aerial seed total	**$177,218**

Weed treatments would limit the expansion of noxious weeds within the burned area especially on areas disturbed during suppression. Treatments are focused on areas that were bladed as control lines. Those lines on or outside of the fire perimeter make up 4.9 miles and 37.3 acres of the total treatment and are limited to the disturbed area only. Additional benefits of the treatment would be to identify any new establishment of weeds on the forest for rapid response in the first year and follow up treatments after BAER work is completed.

Aerial seeding with species that are known to compete against cheatgrass is being proposed in areas where the seedbank may not be sufficient to restore on its own or in areas adjacent to other land ownerships with extensive cheatgrass infestations. The objective is to stabilize soils and protect the integrity of the native and naturalized plant communities.

Roads and Trail Treatments:

Funds requested for Roads and Trails Treatments are as follows to reduce the threat of impact to Critical BAER Values; FS System Roads, FS System Trails, Soil Productivity and Hydrologic Function:

Canal BAER Road & Trail Treatments

Treatment	Need	Cost	Quantity	Unit of Measure	Total
FR088	Dzr/Excv	$ 140	100	cost/hour	$14,000
FR1815	Dzr/Excv	$ 140	5	cost/hour	$700
FR421	Dzr/Excv	$ 140	15	cost/hour	$2,100
FR1652	Dzr/Excv	$ 140	45	cost/hour	$6,300
FR424	Dzr/Excv	$ 140	45	cost/hour	$6,300
FR710	Grader	$ 325	5	cost/hour	$1,625
FR874	Dzr/Excv	$ 140	10	cost/hour	$1,400
FR087	Grader	$ 325	8	cost/hour	$2,600
					$0
Mobilization	Equipment	$ 10	400	cost/mile/item	$4,000
				Total Roads	**$39,025**
Trail Treatment	supplies	$ 250	2	each	$500
Trail Treatment	truck miles	$ 1	450	each	$275
Trail Treatment	GS-5 labor	$ 17	64	hours	$1,071
Trail Treatment	GS-5 labor	$ 17	64	hours	$1,071
					$0
					$0
				Total Trails	**$2,916**
				Total Roads & Trails	**$41,941**

Road treatments would include armoring forded crossings, outsloping, ditching and grading to preserve the road infrastructure investment in Fool Creek, Wide Canyon and Wildhorse Canyon areas. 14.75 miles of roads with an average of 15 waterbars/mile is proposed. Ditching and earthen berms are also proposed to direct flood waters off the road surface or to prevent it from using the road as a channel. 9 armored crossings are proposed in Fool Creek utilizing on site rock materials. Treatment cost is ¼ to 1/3 of replacement cost. With the instability of the soils and the amount of area burned proactive protection treatments are recommended.

Trail treatments are proposed to preserve the trail infrastructure on 2 miles of trail 299 in Wild Horse Canyon. The canyon is completely burned at moderate and high intensities surrounding the trail. Waterbars should be installed every 25 to 50 feet on grades on 20 to 40% and every 100 feet at lower inclines. Native materials will be used to reinforce these structures and it is advised to use cobble or vegetation, where available, at the outlets to dissipate water energy.

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

			NFS Lands				Other Lands				All
Line Items	Units	Unit Cost	# of Units	BAER $	Other $		# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments											
Noxious weed treatments	acres	43	644	$27,859	$0			$0		$0	$27,859
Aerial seed application	acres	86	2059	$177,198	$0			$0		$0	$177,198
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Land Treatments				$205,057	$0			$0		$0	$205,057
B. Heritage											
				$0	$0			$0		$0	$0
				$0	$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Heritage Treatments				$0	$0			$0		$0	$0
C. Road and Trails											
Road Armoring	miles	2,646	15	$39,024	$0			$0		$0	$39,024
Trail Armoring	miles	1,458	2	$2,916	$0			$0		$0	$2,916
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Road and Trails				$41,940	$0			$0		$0	$41,940
D. Protection/Safety											
Storm Patrols	ea	1	2500	$2,500	$0			$0		$0	$2,500
Warning Signs & Supplies	ea	500	4	$2,000	$0			$0		$0	$2,000
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Protection/Safety				$4,500	$0			$0		$0	$4,500
E. BAER Evaluation											
Initial Assessment	Report	$24,279	1	---	$0			$0		$0	$0
				$0	$0			$0		$0	$0
Insert new items above this line!				---	$0			$0		$0	$0
Subtotal Evaluation				$0	$0			$0		$0	$0
F. Monitoring											
				$0	$0			$0		$0	$0
				$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				$251,497	$0			**$0**		**$0**	**$251,497**
Previously approved											

PART VII - APPROVALS

1. Mark D Shaw 7-23-20

Forest Supervisor Date