

Date of Report: 10/05/2020**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:** Williams Fork Fire**B. Fire Number:** CO-ARP-000641**C. State:** CO**D. County:** Grand**E. Region:** 02**F. Forest:** ARP**G. District:** Sulphur**H. Fire Incident Job Code:** P2NE6Z (0210)**I. Date Fire Started:** 08/14/2020**J. Date Fire Contained:** 15% contained on 09/28/20, estimated full containment 10/30/2020**K. Suppression Cost:** 14.4 million (09/28/20)**L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

- Fireline repaired (miles):** Approximately five (5) miles of dozer lines and about one (1) mile of handlines have been repaired using excavators and hand crews. Where appropriate, water bars were constructed.
- Other (identify):**

M. Watershed Numbers:*Table 1: Acres Burned by Watershed*

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
140100010402	Headwaters Williams Fork	28,329	3,2820	12%
140100010403	Keyser Creek	17,469	216	1%
140100010404	Upper Williams Fork	25,811	8,657	34%

N. Total Acres Burned:*Table 2: Total Acres Burned by Ownership*

OWNERSHIP	ACRES
NFS	12,048
OTHER FEDERAL (LIST AGENCY AND ACRES)	
STATE	
PRIVATE	104
TOTAL	12,152

O. Vegetation Types:

The vegetation within the burn area includes a combination of lodgepole pine, subalpine mixed conifer (lodgepole, spruce and fir) and subalpine spruce/fir forests. The pure lodgepole was probably in the 60 to 80 percent mortality from pine beetle, the mixed conifer stands is probably in the 30 to 50 percent mortality, and the spruce fir is probably in the range of 20 to 40 percent mortality.

P. Dominant Soils:

Colluvium and residuum derived from glacial outwash and till, Weathered, metamorphic schist and/or weathered granite and gneiss.

Q. Geologic Types: Geologic Layer: Precambrian and Mesozoic igneous intrusive and metamorphics.

R. Miles of Stream Channels by Order or Class:*Table 3: Miles of Stream Channels by Order or Class*

STREAM TYPE	MILES OF STREAM
PERENNIAL	15.3
INTERMITTENT	21.7
EPHEMERAL	7.2
CANAL/DITCH	0.53

S. Transportation System:

Trails: National Forest (miles): 21.14 Other (miles):
Roads: National Forest (miles): 18.32 Other (miles):

PART III - WATERSHED CONDITION**A. Burn Severity (acres):***Table 4: Burn Severity Acres by Ownership*

Soil Burn Severity	NFS	Private	Total	% within the Fire Perimeter
Unburned	1866	46	1912	16%
Low	2098	19	2116	17%
Moderate	4768	22	4790	39%
High	3317	18	3335	27%
Total	12049	104	12153	100%

B. Water-Repellent Soil (acres): Approximately 3,500 acres in the high and moderate soil burn severity areas exhibited strong water repellency.

C. Soil Erosion Hazard Rating: Slight (6,617 acres); Moderate (5,537 acres); not rated (3 acres)

D. Erosion Potential: 7.40 tons per year

E. Sediment Potential: 2,132 cubic yards per square mile

F. Estimated Vegetative Recovery Period (years): 3 to 5 years

G. Estimated Hydrologic Response (brief description): The Williams Fork burned area is in rocky steep terrain with abundant beetle-kill lodgepole pine. Many of the stream bottoms within the burn scar were mapped with high soil burn severity as well as steep side slopes. As a result, the altered hydrologic function associated with burned soils and vegetation, the primary threat to values at risk for hydrology are associated with flooding, debris flows, and sedimentation. The estimated hydrologic modeling response used the 2-year, 60-minute storm to represent a low intensity storm that has a 50 percent chance of occurring in the next year. The 5-year, 60-minute and 10-year, 60-minute storms were also used to represent stronger thunderstorms in case the area has storms that stall over it and produces heavy rainfall in a short time frame. The design storm magnitudes found using the NOAA Precipitation Frequency Data Server were 0.7, 0.8, and 1.0 inches, respectively. Experience with other natural and prescribed fires indicates that while storms of 0.5 inch or greater will cause erosion and elevated floods and sediment loads, it is typically 1 inch or greater high intensity storms that produce significant damage.

Considering all of these factors, a substantial post-fire storm response is likely. Although adjustments were made for the hydrologic modeling, including increasing curve numbers, the rapid analysis may not fully capture the flood flows and post-fire storm response.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Williams Fork Fire, seven miles southwest of Fraser, Colorado, started near the Henderson Mill on August 14th and quickly grew due to high winds, steep slopes, and dense fuels. Working with long term fire behavior analysts, foresters, and other natural resource specialists, Williams Fork firefighters successfully contained the southwest flank along County Road 3 and 30, and the Williams Fork River, preventing damage to the Henderson Mill.

The BAER assessment started on September 21, 2020 utilizing the September 11, 2020 fire perimeter of 12,153 acres with the final report completed on October 2, 2020. The Critical Values spreadsheet in the project file summarizes critical values evaluated and the risk assessment to identify where a BAER emergency exists that warrants treatment. Risk assessment focused on the most probable damaging storm events, which are high intensity short duration thunderstorms during the July/August monsoon season.

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

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

The critical value table posted in box provides details on how risk ratings were derived; a summary is provided below.

1. Human Life and Safety (HLS):

- a. Human life and safety is at risk on NFS lands from threats associated with hazard trees, rock fall, increased flooding and debris flows, and loss of egress/access through out the burned area, but particularly on roads and trails. The trails within the burned area are within high and moderate soil burn severity. An emergency was determined to exist as the probability is likely and the magnitude of consequences is major resulting in a very high risk rating,

- b. The flood hazard is predicted to increase within and immediately downstream of the burn area for forest visitors and workers on NFS lands. An emergency for flood hazard was determined for the following reasons: runoff is predicted to increase significantly following the fire. There is substantial risk to life and property resulting from the increased flood risk, especially at roads, trails, and trailheads located within the floodplain. It was determined that the risk on NFS lands is high to very high throughout the fire, especially at roads and trails that access the burned area. An emergency exists and response actions have been proposed by the BAER team engineering and recreation resource specialists.
 - c. The debris flow hazard is expected to increase significantly in the years following the fire. Potential for debris flows and mass movement of soil, especially along the Kiney Creek road and other similar steep drainages, may result.
- 2. Property (P):** Threats to property and infrastructure on NFS lands within the burned area exist along the road and trail network, most specifically in areas of moderate and high soil burn severity. Damage to or loss of sections of road and trail could occur from increased runoff, erosion, flooding, and potentially debris flows within and downstream of areas of moderate and high soil burn severity. An emergency exists for it was determined that the probability is likely and the magnitude of consequences is moderate resulting in a high risk rating.
- 3. Natural Resources (NR):** Threats to hydrologic function and water quality on NFS lands within the burned area exist on areas of moderate and high burn severity. The presence of hydrophobic soils, loss of canopy cover, loss of ground cover, and loss of channel stabilizing riparian vegetation all have the potential to contribute to altered hydrologic function and watershed response to precipitation events within burned watersheds. This is expected to be a short-term effect. The probability of hydrologic function impairment is very likely, and the magnitude is minor. An emergency does not exist.
- b. Native plant communities are at risk of invasion by known populations of Colorado State listed noxious weeds adjacent to areas of high and moderate SBS, and areas disturbed by suppression activities. Noxious weed infestations pose a serious threat to the composition, structure, and function of native plant communities. In noxious weed ecology, any reduction in competition for available nutrients, space, or light is considered an advantage to noxious weeds growth and establishment. An emergency was determined to exist as the probability is very likely and the magnitude of consequences is major resulting in a very high risk rating.
- 4. Cultural and Heritage Resources:** There are no eligible heritage resources within the burn area, therefore, no emergency exists.

B. Emergency Treatment Objectives:

- a. Reduce the post-fire risks to life and safety through administrative and physical closures of trails and roads, signing, and monitoring.
- b. Storm-proof and stabilize roads and trails to protect the property investment.
- c. No treatments are proposed for soil and hydrologic function.

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

Land: 80

Channel: NA

Roads/Trails: 75

Protection/Safety: 85

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land	70	75	80
Channel			
Roads/Trails	80	90	90
Protection/Safety	85	90	95

E. Cost of No-Action (Including Loss): \$201,000

F. Cost of Selected Alternative (Including Loss): \$83,438

G. Skills Represented on Burned-Area Survey Team:

☒ Soils ☒ Hydrology ☒ Engineering ☒ GIS ☒ Archaeology
☒ Weeds ☒ Recreation ☒ Fisheries ☒ Wildlife

Team Leader: Beth Anderson

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Forest BAER Coordinator: Eric Schroder

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Phone(s): 303-541-2538

Team Members: Table 7: BAER Team Members by Skill

Skill	Team Member Name
Team Lead(s)	Beth Anderson
Soils	Ryan Adams
Hydrology	Leah Shipstead
Engineering	Cait Woods, Karen Mighell (t)
GIS	Janice Naylor
Archaeology	Dan Snyder
Recreation	Andy Borek
Fisheries	Matt Fairchild, Valerie Thompson (t)
Wildlife	Aurelia DeNasha
Public Affairs	Reid Armstrong
Weeds	Tom Bates

H. Treatment Narrative:

Land Treatments: [Click here to enter text.](#)

L1a. Invasives EDRR. Early detection/rapid response (EDRR) surveys will focus on areas of unimpaired native plant communities that burned at high or moderate soil burn severity and are adjacent to known Colorado State listed noxious weeds, as well as areas disturbed by suppression activities. EDRR will be used to minimize the potential for new noxious weed infestations and ensure the natural recovery of native perennial grasses and forbs. If new weed populations are found they would be promptly treated to minimize the potential to spread and lead to the modification of native plant communities..

Treatment	Units	Unit Cost	# of Units	Total Cost
L1a - Invasives EDRR	Acres	\$130	99	\$12,870

Channel Treatments: none

Roads and Trail Treatments:

RT1a. Road drainage and storm proofing (storm proofing existing drainage features): Storm proof drainage features where identified to protect the road investment. Activity will include cleaning culvert inlets, road ditches, and ensuring water does not concentrate on the road.

Treatment	Units	Unit Cost	# of Units	Total Cost
Storm proofing	mile	\$1,575	5.1	\$8,033
Rolling Dip	each	\$375	11.0	\$4,125
Bridge Pier Armoring	CY	\$120	80.0	\$9,600
TOTAL				\$21,758

RT2: Storm Inspection and Response: Storm Inspection and Response will keep culverts and drainage features functional by clearing sediment and debris between storms to retain the effectiveness of these features.

Treatment	Units	Unit Cost	# of Units	Total Cost
Storm Inspection and Response (Roads)	Trip/Day	\$1,000	3	\$3,000
GS-11 COR Salary (roads)c	Day	\$400	10	\$4,000
400GS-12 CO Salary	Day	\$450	3	\$1,350
GS-11 COR Salary (trails)	Day	\$400	3	\$1,200
TOTAL				\$9,550

RT4. Armored Dip: The dip will serve to direct high flows across the road with minimal damage to the road surface and prism.

Treatment	Units	Unit Cost	# of Units	Total Cost
RT4 Armored Critical Dip	Each	\$1,000	6	\$6,000

RT13: Trail Drainage and Stabilization: This treatment will improve surface drainage on the trail tread to limit erosion and to ensure safe use and travel on the trail for BAER treatment crews. Clearing and improving undamaged drainage structures will ensure capacity to accommodate increased runoff (water bars, rolling dips). Trail will also be outsloped where appropriate and feasible. Work will include cutting hazard trees as appropriate for worker safety.

Treatment	Units	Unit Cost	# of Units	Total Cost
Kinney Creek Trail #N22	Mile	\$4,800	2.0	\$9,600
Keyser Ridge Loop M140	Mile	\$4,800	1.5	\$7,200
Elk Wallow M141	Mile	\$4,800	0.5	\$2,400
K & K Connector M142	Mile	\$4,800	0.2	\$960
TOTAL				\$20,160

Protection/Safety Treatments:

Road Hazard Warning Signs and Gates

This treatment will design and install burned area warning signs to caution forest visitors recreating and administrative users about the potential hazards that exist within the burned area. It is consistent with the language provided in the BAER Treatments Catalog. This treatment will place closure signs, hazard warning signs and information signs at key entry points or trail junctions, and numerous recreation trailheads. It will inform users of the dangers associated with entering/recreating within a burned area as well as inform them of closures to help ensure that users are able to access available routes in a safe manner. The warning signs will identify the types of hazards to watch for at roads, trails, and campgrounds.

P1a. Road Hazard Signs: This treatment will install burned area warning signs at key road entry points to caution forest users of burned area hazards and/or closures.

Treatment	Units	Unit Cost	# of Units	Total Cost
Road Hazard Sign	Each	\$400	1	\$400

P1b: Trail/Recreation Hazard Signs: This treatment will install burned-area warning signs at trailheads and on trails intersecting the fire perimeter.

Treatment	Units	Unit Cost	# of Units	Total Cost
Trail/Recreation Hazard Signs	Each	\$185	20	\$3,700

P2. Road Closure Devices (gate, berm, boulders, etc.): This treatment will install temporary closure gates with required signage to implement access restrictions to high risk areas in the period immediately following the fire. The ARP NF will determine the appropriate time to lift these closures.

Treatment	Units	Unit Cost	# of Units	Total Cost
P2 Road Closure Device (Gate)	Each	\$3,000	3	\$9,000

I. Monitoring and Implementation Narrative: none

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

			NFS Lands			Other Lands				All
		Unit	# of		Other	# of	Fed	# of	on F	Total
Line Items	Units	Cost	Units	BAER \$	\$	units	\$	Units	\$	\$
A. Land Treatments										
L1a-Invasivess EDRR	acre	130	99	\$12,870	\$0		\$0		\$0	\$12,870
L1b-EDRR Suppression	acre			\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$12,870	\$0		\$0		\$0	\$12,870
B. Channel Treatments										
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treatments				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
RT 1a Stormproofing	mile	1,575	5	\$8,033	\$0		\$0		\$0	\$8,033
RT 1a Rolling Dip	each	375	11	\$4,125	\$0		\$0		\$0	\$4,125
RT 1a Bridge Armoring	CY	120	80	\$9,600						\$9,600
RT 2 Storm Inspection/Response/Day	trip/Day	1,000	3	\$3,000						\$3,000
RT Armored Dip	each	1,000	6	\$6,000						\$6,000
RT13 Trail Drainage	miles	4,800	4	\$20,160						\$20,160
GS-11 COR Salary (road)	day	\$400	10	\$4,000	\$0		\$0		\$0	\$4,000
GS-12 CO Salary	day	\$450	3	\$1,350	\$0		\$0		\$0	\$1,350
GS-11 COR Salary (trail)	day	\$400	3	\$1,200						\$1,200
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Road and Trails				\$57,468	\$0		\$0		\$0	\$57,468
D. Protection/Safety										
P1a Road Hazard Sign	each	400	1	\$400	\$0		\$0		\$0	\$400
P2 Road Closure Device (Gate)	each	3,000	3	\$9,000	\$0		\$0		\$0	\$9,000
P1b Trail Hazard Signs	each	185	20	\$3,700						\$3,700
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Protection/Safety				\$13,100	\$0		\$0		\$0	\$13,100
E. BAER Evaluation										
Initial Assessment	Report				\$36,963		\$0		\$0	
Insert new items above this line!				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				\$0	\$36,963		\$0		\$0	\$0
F. Monitoring										
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals										
				\$83,438	\$36,963		\$0		\$0	\$83,438
Previously approved										

PART VII - APPROVALS

1. _____
Forest Supervisor Date