Date of Report: October 13, 2021

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: Sand Creek Fire

B. Fire Number: WY-SHF-00414

C. State: WY

D. County: Fremont

E. Region: 02

F. Forest: Shoshone

G. District: Washakie

H. Fire Incident Job Code: 0214 P2N9QJ

I. Date Fire Started: 9/9/2021

J. Date Fire Contained: 10/03/2021

K. Suppression Cost: 3.6M

L. Fire Suppression Damages Repaired with Suppression Funds (estimates):

1. **Fireline repaired (miles):** 2.5 (most hand/saw line in Division Alpha and Delta has not been repaired and is unlikely to be repaired before a season-ending precipitation event).
2. **Other (identify):**
   - Motorized closure signage installed, and water bars constructed on 0.25 miles of non-system road used by fire vehicles.
   - Material scattered on 0.25 miles of user-created roads.
   - Trash, equipment, and flagging removed from hand and saw lines.
   - Slash piles on hand and saw lines lopped and scattered on portions of hand/saw lines.
   - Seed was purchased as part of the rehab plan for disturbed concentrated use areas; however, planting the seeding prior to a season ending event is unlikely. This may be delayed until spring.

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

NHD HUC #	NHD Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
100800030207	Sand Creek	15,714.8	227.6	1.4%
100800030208	Middle North Popo Agie	27,392.7	558.0	2.0%
100800030209	Lower North Popo Agie	23,935.5	143.2	0.6%

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	703.6
OTHER FEDERAL (LIST AGENCY AND ACRES)	225.2 BLM
STATE	0
PRIVATE	0
TOTAL	928.8

O. Vegetation Types: The majority of vegetation in the burned area was in located in the Loamy 15-19" Foothills and Mountains, Upland Cool Woodland, Sub-irrigated Cool Woodland, and Upland Warm Woodland ecological sites. Site conditions were in fair to good condition prior to the burn. The area consists of conifer woodlands, aspen, native cool season grasses, mid-stature shrubs, and juniper.

P. **Dominant Soils:** Primarily Rock outcrop-Elting-Jeru families, complex, 15 to 60 percent slopes (293 acres); Winspect-Kiev-Bigsheep families, complex, 15 to 40 percent slopes (186 acres); Lolo family-Rock outcrop-Shamut family, complex, 15 to 60 percent slopes (102 acres); Moose River-Elvick families, complex, 3 to 25 percent slopes (58 acres); and, Jeru-Swapps-McCall families, complex, 7 to 40 percent slopes (47 acres). The NRCS Web Soil Survey Tool rates "damage by fire" as low (221 acres) to moderately (188 acres) susceptible (293 acres rock outcrop not rated). A > 201 cm depth to a restrictive layer is predominant throughout the burn. Representative slopes are 4 to 35 percent.

Q. Geologic Types: The northern portion of the fire is comprised of the Madison Limestone and Darby Formations and moving to the south is the Bighorn Dolomite, Gros Ventre Formation, and Flathead Sandstone. Pleistocene glacial debris separates these Paleozoic sedimentary rocks from the Archean quartz diorite of the Louis Lake Batholith which makes up the southern end of the fire. Parent material is colluvium derived from limestone and dolomite (290 acres) and till and alluvium derived from granite (104 acres); the remaining acreage is rock outcrop (293 acres).

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class within Fire Perimeter

STREAM TYPE	MILES OF STREAM
PERENNIAL	0.348
INTERMITTENT	0.581
EPHEMERAL	0.547
OTHER (DEFINE)	Pond Acres – 0.294

S. Transportation System:

Trails: *National Forest (miles):* 0 *Other (miles):* 0

Roads: *National Forest (miles):* 0.38 *Other (miles):* 0.65 (closed road – ML 1)

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	Other Federal (BLM)	State	Private	Total	% within the Fire Perimeter
Unburned	74.64	34.10	0	0	0	11.71%
Low	451.94	126.64	0	0	0	62.29%
Moderate	172.94	51.65	0	0	0	24.18%
High	4.10	12.80	0	0	0	1.82%
Total	703.61	225.18	0	0	0	

B. Water-Repellent Soil (acres): 4 acres. Field validation was limited for this assessment. Based on soil type and geology, the estimated water-repellent soils are estimated to align with the high burn severity areas.

C. Soil Erosion Hazard Rating: 356.3 acres slight, 52.9 acres moderate, and 293.5 not rated (bedrock dominated)

D. Erosion Potential: Not modeled for this assessment based on risk assessment.

E. Sediment Potential: Not modeled for this assessment based on risk assessment.

F. Estimated Vegetative Recovery Period (years): 2-3 years

G. Estimated Hydrologic Response (brief description): Not modeled for this assessment based on risk assessment.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

A. **Describe Critical Values/Resources and Threats (narrative):** The risk assessment identified a high risk to the BAER critical value of native plants from a possible threat of invasion of non-natives with a major magnitude of consequence since weed infestation would cause irreversible damage not only to native plants but also to big game crucial winter habitat and to R2 Sensitive species. Although R2 sensitive species are not considered a BAER critical value it was included in the BAER Critical Values Table (attached below) since it is directly linked with the native plants critical value.

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):** None
2. **Property (P):** None
3. **Natural Resources (NR)**: See below summary table
   a. Native Plants: High risk
   b. T&E Habitat: None
      i. Sensitive Species (Non-BAER Critical Value): High risk rating to native plants and wildlife and low risk rating for fisheries.
   c. Soil & Water: Low risk
4. **Cultural and Heritage Resources:** Intermediate risk rating for cultural resources and heritage protections.
5. **Other FS Property:** One mile of boundary fence between Forest Service and BLM managed lands was damaged. The fence serves to delineate boundaries between management agencies, grazing allotment permittees, and for the recreating public. The two agencies are pursuing replacement independent of the BAER process; however, if this is unsuccessful, this value should be considered for inclusion in the infrastructure pilot program.

BAER Critical Values & Risk Summary

Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk
Natural Resources - Native Plants	Native or naturalized communities on NFS lands where invasive species or noxious weeds are absent or present in only minor amounts	~~Invasion of noxious weeds, displacement of native plants~~ and loss of R2 SS: Fremont's bladderpod (Lesquerella fremontii), and Wyoming tansymustard (Descaurania torulosa)	Possible	Dry shallow soils, low soil moisture, local invasives source in the area	Major	Known and predicted endemic plant populations, low to no weed infestation in the interior and a high susceptibility to invasion with cheatgrass and other invasive weeds near boundary fence and road	High
Natural Resources - T&E habitat	Non-BAER Values: Habitat for northern goshawk, Rocky Mountain bighorn sheep, northern harrier, and the olive-sided flycatcher (all R2 SS). Moose (SNF SOC). Adjacent crucial winter range for elk, bighorn sheep, mule deer, and moose.	Invasion of non-natives into crucial winter range, reduced competitive ability of native plant species, and loss of winter forage	Possible	Known occurrences of invasive plants both adjacent to and within the burn perimeter	Major	Localized loss of forage for ungulates. Reduced competitive ability of native plant species that result in irreversible damage to big game crucial winter range	High
Natural Resources - T&E habitat	Non-BAER Value: Yellowstone cutthroat trout (R2 sensitive species)	Sediment delivery to channel, fish habitat degradation	Unlikely	Core populations are outside of the burned area	Minor	Probability of listed threats occurring to core populations within burned area is low	Very Low
Cultural Resources	Cultural resources and heritage	Increased site visibility; increased potential for looting activity; threat to sites from post-fire erosion	Possible	Protective duff layer burnt off in places exposing cultural materials for looting and increasing erosional potential of soil matrix of cultural sites.	Moderate	No cultural resource surveys within the fire perimeter and a high likelihood of sites indicated by predictive model	Intermediate

Life/ Property/ Resources	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk
Natural Resources - Soil and Water	Hydrologic function	Change in channel dimensions and bank stability; sediment delivery and water quality; sediment delivery to fen wetland	Possible	Steep relief areas paired with soil stability rating indicate some sediment mobility to water resources	Minor	Post-fire effects are recoverable and localized effects; loss of fen wetland that burned (peat) are not recoverable	Low
Natural Resources - Soil and Water	Soil productivity and stability	Erosion, loss of soil moisture	Possible	Soil severity is predominantly rated as low; burn area has steep slopes	Minor	Vegetative recovery is expected to mitigate; recoverable and localized	Low

B. Emergency Treatment Objectives:

Objective 1: *Rapidly detect new non-native plant establishment in the suppression disturbed and high risk burned areas.*

Objective 2: *Minimize introduction and expansion of invasive species into native plant communities. Protect the integrity of native plant communities from the risk of non-native plant establishment (noxious and invasive) focusing treatment on new populations to prevent them from becoming vectors for spread.*

Critical values at risk associated with post-fire invasive plant establishment include crucial range for multiple species, including moose, the Temple Peak bighorn sheep herd, elk, and mule deer. Plant communities most at risk are those closest to the roads, the suppression related disturbance areas, and those closest to known populations of weeds (i.e., known weed infestation on FSR 334 and BLM area of the fire perimeter). These native plant communities are a critical resource for maintaining the ecological integrity of Forest Service lands and watershed health, provide wildlife habitat, and forage for livestock and big game.

The non-native data available for this area shows limited occurrences for pre-existing weeds. A ~1-acre weed infestation on Forest Service Road (FSR) 334 was documented and consisted of Canada thistle (*Cirsium arvense*), smooth brome (*Bromus inermis*), and Kentucky bluegrass (*Poa pratensis*). Several areas on the fire were accessed from that location, including: roads and staging areas in Division Alpha, hand and saw lines in Division Alpha, and vehicle parking areas at Dickinson Park Guard Station. Cheatgrass (Bromus tectorum) was present on BLM lands in the lower elevations of the North Fork Popo Agie Canyon, near Heart Ranch. It is likely that small amounts of cheatgrass are also located throughout the entire BLM portion of the land as well.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: Probability of completing within the first year is 70-90%.
Channel: n/a
Roads/Trails: n/a
Protection/Safety: n/a

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	***3 years after treatment***	***5 years after treatment***
Land	60-90%	60-90%	60-90%
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): $34,750

a. Vegetative recovery is estimated to take up to three years. With only one year of emergency treatment, there is still some probability for non-native establishment. However, the benefits of treatment still outweigh the cost of no-treatment.

F. Cost of Selected Alternative (Including Loss):

Fire Name	Sand Creek
Location	Shoshone National Forest
Date	10/8/2021

SUMMARY	**Total Treatment Cost**	**$ 13,900**
	Expected Benefit of Treatment	**$ -**
	Implied Minimum Value	**$ 34,750**

	Value Type	Value at Risk	Implied Value and/or Benefit Cost
Location A	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	**Yes**	
	Market Values: Direct	No	$ -
	Market Values: Loss of Use	No	$ -
	Total Market Resource Value		$ -
	Proposed Treatment		$ 13,900
	Reduction in Probability of Loss		0.40
	Expected Benefit of Treatment		$ -
	Exp B/C Ratio of Treatment for Market Resources Only		
	***Implied Minimum Value* of Protecting Non-Market Resource**		**$ 34,750**

G. Skills Represented on Burned-Area Survey Team:

☐ Soils ☒ Hydrology ☐ Engineering ☒ GIS ☒ Archaeology
☒ Weeds ☐ Recreation ☒ Fisheries ☒ Wildlife
☐ Other:

Team Leaders: Karri Cary
Email: karri.cary@usda.gov **Phone(s):** 307-578-5163; (cell: 307-250-5170)
Email: gwen.gerber@fs.fed.us **Phone(s):** 307-335-2174

Forest BAER Coordinator: Gwen Gerber (Acting for Kassy Skeen)
Email: gwen.gerber@fs.fed.us **Phone(s):** 307-335-2174

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

Skill	Team Member Name
Team Lead(s)	Karri Cary & Gwen Gerber
Hydrology/Soils	Gwen Gerber
Engineering	N/A
GIS	Shannon Pils
Archaeology	Kyle Wright
Weeds	Jason Brengle
Recreation	N/A
Fisheries	Shawn Anderson
Wildlife	Joe Flower
Other	

H. Treatment Narrative:

Land Treatments:

Natural Resources (Native Plants) Critical Value Treatment (Very High Risk)

a. Response Action: Early Detection Rapid Response (EDRR).
    i. Monitoring and inventory will occur in high-risk areas of the burned area (approximately 60 acres). Inventory and survey target times are early fall and early spring and completed through botany contracts or agreements with the County Weed and Pest.
    ii. Costs are based on previous efforts, the accessibility and mobilization, and variability in price between existing contracts/agreements.
    iii. 60 high risk acres x $25/acre = $1,500
b. Weed populations discovered will be treated as quickly as possible. Fall or spring herbicide application treatments will occur using backpack crews or horseback sprayers. This work will be completed through existing agreements with the County Weed and Pest.
    i. Costs are based on the existing agreement.
    ii. 20 acres x $620/acre = $12,400

Channel Treatments: n/a

Roads and Trail Treatments: n/a

Protection/Safety Treatments: n/a

I. Monitoring Narrative:

Natural Resources (Native Plants) Critical Value

a. Monitoring will occur through the EDRR surveys, by forest service personnel, and may be needed for 2-3 years post-fire. Additional monitoring funding is not being requested through BAER.

Cultural Resources Critical Value

a. The burned area location has not been previously surveyed but predictive models show a high probability for sites. Surveys will be completed independent of the BAER process within the first post-fire year to monitor for exposed cultural and heritage resources. Actions to protect these resources will be developed and implemented as needed.

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										
EDRR - Survey & Treatment				$13,900	$0		$0		$0	$13,900
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$13,900	$0		$0		$0	$13,900
B. Channel Treatments										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$0	$0		$0		$0	$0
D. Protection/Safety										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$0	$0		$0		$0	$0
E. BAER Evaluation										
Initial Assessment				---	$0		$0		$0	$0
Assessment & Report				$6,931	$0		$0		$0	$6,931
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$6,931	$0		$0		$0	$6,931
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				$20,831	$0		**$0**		**$0**	**$20,831**
Previously approved										
Total for this request				~~$20,831~~						

Total Request: $13,900. Evaluation costs excluded

PART VII - APPROVALS

HELEN DURISKO Digitally signed by HELEN DURISKO
Date: 2021.10.13 12:16:00 -06'00'

Forest Supervisor Date