

Date of Report: 10/6/2020**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: William****B. Fire Number: UT-NWS-891****C. State: Utah****D. County: Utah and Juab****E. Region: R4, Intermountain Region****F. Forest: Uinta Wasatch Cache****G. District: Spanish Fork****H. Fire Incident Job Code: PNNJ7E (1502)****I. Date Fire Started: 9/6/2020****J. Date Fire Contained: 49% on 10/2/2020****K. Suppression Cost: \$6,100,100 on 10/2/2020****L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

1. Fireline repaired (miles): 21.4 miles of dozer line; 1.7 miles of handline
2. Other (identify):

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

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
160202010108	Wash Spring Valley	9,212	2,006	22%
160202010109	Mona Reservoir- Current Creek	39,497	1,508	4%
160202010301	Summit Creek	20,661	1,388	7%

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

OWNERSHIP	ACRES
NFS	2,801
OTHER FEDERAL (LIST AGENCY AND ACRES)	N/A

OWNERSHIP	ACRES
STATE	1,208
PRIVATE	893
TOTAL	4,902

O. **Vegetation Types:** Oak, Maple, Pinyon-Juniper, Mixed Conifer, Shrubs, Grasses

P. **Dominant Soils:** Lundy-Rock outcrop complex (24%); Rock outcrop (13.5%); Pachic Calcixerolls (10.6%); Bezzant gravelly loam (8.0%); Pachic Cryoborolls (6.9%); Lizzant very cobbly loam (6.5%); Dry Creek cobbly loam (6.1%)

Q. **Geologic Types:** Dolomite, limestone, older landslide deposits.

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	0.8
INTERMITTENT	13
EPHEMERAL	0
OTHER (DEFINE)	0

S. **Transportation System:**

Trails: National Forest (miles): 0

Other (miles): 0

Roads: National Forest (miles): 2.0 (ML1)

Other (miles): 6.1 (Private/County)

PART III - WATERSHED CONDITION

A. **Burn Severity (acres):**

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	Other Federal (List Agency)	State	Private	Total	% within the Fire Perimeter
Unburned	627	0	78	114	819	14%
Low	794	0	320	195	1,309	23%
Moderate	1,584	0	618	438	2,640	46%
High	423	0	270	260	953	17%
Total	3,428	0	1,286	1,007	5,721	100%

B. **Water-Repellent Soil (acres):** 3,593 acres

C. **Soil Erosion Hazard Rating:** Not rated for soil map units in the BAER analysis area.

D. **Erosion Potential:** WEPPcloud-PEP model runs were completed on four different burned watersheds within the analysis area. The watershed name, size, hillslope soil loss, channel soil loss are predicted as follows:

1. Pole Canyon: 1,900 acres; 1,900 tons/year hillslope soil loss; 9,100 tons/year channel soil loss.
2. Unnamed canyon north of Wash Canyon: 660 acres; 890 tons/year hillslope soil loss; 420 tons/year channel soil loss.
3. Wash Canyon: 950 acres; 700 tons/year hillslope soil loss; 17 tons/year channel soil loss.
4. Mendenhall Creek: 300 acres; 280 tons/year hillslope loss; 26 tons/year channel soil loss.

E. Sediment Potential: WEPPcloud-PEP model runs were completed on four different burned watersheds within the analysis area. The watershed name, size, and sediment delivery to the watershed outlet is predicted as follows:

1. Pole Canyon: 1,900 acres; 8,300 tons/year
2. Unnamed canyon north of Wash Canyon: 660 acres; 780 tons/year
3. Wash Canyon: 950 acres; 490 tons/year
4. Mendenhall Creek: 300 acres; 200 tons/year

The modeled channel erosion and sediment delivery for Pole Canyon are noteworthy in that both metrics suggest that extensive gully enlargement and formation are to be expected should a damaging runoff event occur. Smaller gullies are already present in the valley bottom, which is composed of older landslide deposits. These existing gully features are expected to widen and deepen during post-fire flood events.

F. Estimated Vegetative Recovery Period (years): 3-5 years for oak/maple; 20-25 years for mixed conifer

G. Estimated Hydrologic Response (brief description): An analysis of expected peak flows was conducted in the WEPPcloud (pre-fire) and WEPPcloud-PEP (post fire) models for the 2, 5, and 10-year return interval flood events. The results of the modeling are presented below in table 5. These increases in peak flows are expected to occur in response to short duration, high intensity thunderstorms. The increased watershed response to these precipitation events is expected to persist for approximately 3 to 5 years while canopy vegetation, ground cover, and soil hydrophobicity recover to pre-fire conditions.

Table 5. Pre and post fire peak flows

Modeled Watershed	Pre-fire Q2 (cfs)	Post-fire Q2 (cfs)	Pre-fire Q5 (cfs)	Post-fire Q5 (cfs)	Pre-fire Q10 (cfs)	Post-fire Q10 (cfs)
Pole Canyon	16	190	27	270	51	380
Unnamed Canyon North of Wash Canyon	7	94	10	150	15	190
Wash Canyon	14	160	28	220	33	330
Mendenhall Creek	10	54	13	76	18	100

An analysis of post-fire debris flow threats in response to a range of rainfall intensities was conducted by the USGS. When a 15-minute rainfall intensity of 24 millimeters per hour design storm was modeled (equivalent to approximately 0.25" of rain in 15 minutes), the probability of debris flows occurring on the burn scar is 80-100% in the Mendenhall Creek drainage, 60-80% in the unnamed canyon north of Wash Canyon, 40-60% in Wash Canyon, and 40-60% in Pole Canyon. During the field review of this burnscar, recent debris flow deposits were observed near the bottoms of Wash Canyon and Mendenhall Creek. All of the canyons along the western flank of the burnscar, above Interstate 15 have well-developed alluvial fans. The valley bottom in Pole Canyon has been previously mapped by the Utah Geological Survey as historic landslide deposits.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The William fire was caused by target shooting in Pole Canyon on the afternoon of September 6th, 2020. It quickly burned up Pole Canyon before becoming established in the Mt. Nebo Wilderness on the Spanish Fork Ranger District. By September 18th the fire was approximately 4,300 acres and was presenting numerous containment challenges for fire managers who had been able to construct a series of dozer lines along the west flank of the fire, at the toe of the mountain. The decision was made to conduct a firing operation along the west flank in order to achieve gains in containment. Upon completion of the firing operation the fire was mapped at approximately 5,800 acres.

During the BAER survey, potential threats to the county and private road network in Pole Canyon were identified by the BAER team. Those responsible for the maintenance of these roads are advised to inspect stream crossing structures to determine capacity for the expected increases in post-fire runoff. Santaquin City has constructed a large berm and channel that appears to route flood runoff from Pole Canyon east into the debris basin at the mouth of Santaquin Canyon. The City Engineer or equivalent is advised to evaluate the capacity of this structure given the expected increases in post fire runoff in Pole Canyon. Numerous homes are below the structure.

The debris flow threats are greatest in the canyons and alluvial fans along the west side of the burnscar. Infrastructure below the burnscar and above the Interstate appears to be limited to livestock water developments and two small reservoirs. The owners of these developments are advised to examine threats to the water sources and conveyance infrastructure.

The remainder of this report will focus on threats to Critical BAER values as identified in FSM 2523 – Emergency Stabilization – Burned Area Emergency Response.

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

Table 6: 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):

- a. Human life and safety of Forest visitors and employees traveling cross-country through the burned area (not on system roads or trails) is threatened due to the potential for injury or loss of life from debris flows, flash floods, falling trees, rolling rocks, and other burned area hazards. The probability of damage or loss is **unlikely** as cross country travel through the burned area is rare due to the extremely steep slopes. The magnitude of consequence is **major** since a entrapment or being hit by falling debris could result in serious injury or loss of life. The risk level is **intermediate**. Treatments are not recommended as there is no designated access into or through the burned area.

2. Property (P):No threats to NFS property have been identified.

3. **Natural Resources (NR):**Soil productivity and hydrologic function on NFS lands within the burnscar are threatened due to the potential for increased runoff and erosion of soil horizons. The probability of damage or loss is **likely** as hillslopes within the upper portions of the burned area are very steep. Soil burn severity for many of the slopes of concern was in the moderate or high SBS class. The magnitude of consequence is **moderate**. Damage to the soil resource is expected to be considerable following thunderstorms and will result in hillslope erosion, channel scouring, and gully formation. The risk rating is **high**. The burned NFS lands are located within the Mt Nebo Wilderness and an unacceptable risk to the wilderness resource is not present. Emergency stabilization efforts would not mitigate threats to other critical BAER values outside of the Wilderness area. Treatments are not recommended.

- b. Water used for agricultural supply on NFS lands is threatened due to the potential for increased sedimentation following flash flood and/or debris flow events. The threatened water sources in Mendenhall Creek and Dry Canyon are used to supply water to off-forest livestock watering troughs and reservoirs. The probability of damage or loss is **likely** given the expected increases in peak flood discharge and probability of debris flows in these

drainages. The magnitude of consequence is **minor** as water quality degradation is from the threat is expected to be localized and will recover following the damaging events. The risk rating is **low**. Treatments are not recommended

- c. Native plant communities on NFS lands located along the dozer and hand lines (1.1 acres total area) are threatened by the potential introduction of non-native invasive species (NNIS). The probability of damage or loss is **likely**. During initial attack operational period READs were not assigned to the fire. NNIS mitigation tactics were not implemented. Firefighting equipment is assumed to be a vector for introduction of NNIS. The magnitude of consequence is **minor**. The risk rating is **very low**. Emergency treatments are not recommended. Follow-up detection and spraying along this feature by the District weed crew is recommended during spring and summer of 2021.

4. Cultural and Heritage Resources: No threats to cultural and heritage resources have been identified.

B. Emergency Treatment Objectives: No treatments proposed.

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

Land: N/A

Channel: N/A

Roads/Trails: N/A

Protection/Safety: N/A

D. Probability of Treatment Success

Table 7: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land	N/A		
Channel	N/A		
Roads/Trails	N/A		
Protection/Safety	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:

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

Team Leader: Brendan Waterman

Email: brendan.waterman@usda.gov

Phone(s) 385-377-4338

Forest BAER Coordinator:

Email: Brendan Waterman

Phone(s): 385-377-4338

Team Members: Table 8: BAER Team Members by Skill

Skill	Team Member Name
Team Lead(s)	Brendan Waterman
Soils	Brendan Waterman
Hydrology	Charlie Condrat

Skill	Team Member Name
<i>Engineering</i>	
<i>GIS</i>	
<i>Archaeology</i>	Rachelle Handley - consulted
<i>Weeds</i>	Jana Leinbach - consulted
<i>Recreation</i>	
<i>Other</i>	

H. Treatment Narrative: None recommended.

Land Treatments: N/A

Channel Treatments: N/A

Roads and Trail Treatments: N/A

Protection/Safety Treatments: N/A

I. Monitoring Narrative: N/A

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands				All Total \$
			# of Units	BAER \$		# of units	Fed \$	# of Units	Non Fed \$	
A. Land Treatments										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				\$0	\$0		\$0		\$0	\$0
B. Channel Treatments										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road and Trails</i>				\$0	\$0		\$0		\$0	\$0
D. Protection/Safety										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				\$0	\$0		\$0		\$0	\$0
E. BAER Evaluation										
Initial Assessment	Report	\$2,000		---	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				---	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				\$0	\$0		\$0		\$0	\$0
F. Monitoring										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$0	\$0		\$0		\$0	\$0
G. Totals				\$0	\$0		\$0		\$0	\$0
Previously approved										
Total for this request				\$0						

PART VII - APPROVALS

1. _____
 Forest Supervisor _____ Date _____

