Date of Report: 10.21.2021

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: Vinegar Fire

B. Fire Number: ID.PAF.000433

C. State: Idaho

D. County: Valley

E. Region: R3

F. Forest: Payette NF

G. District: Krassel

H. Fire Incident Job Code: P4NGA321

I. Date Fire Started: 07-17-2021

J. Date Fire Contained: 10-13-2021

K. Suppression Cost: $286,000

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

1. **Fireline repaired (miles):** 0.1
2. **Other (identify):**

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170602060902	Cabin Creek	15929	3091	19%

N. Total Acres Burned: 3,091

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	3,091
OTHER FEDERAL (LIST AGENCY AND ACRES)	
STATE	
PRIVATE	
TOTAL	3,091

O. Vegetation Types: Douglas-fir and ponderosa pine are the dominant tree species. Understory consists of tall brush such as snowberry, ninebark, tall huckleberry and pinegrass. The most common habitat types are the Douglas-fir types; Douglas-fir/snowberry, Douglas-fir ninebark, Douglas-fir/pinegrass. At the higher elevations, Subalpine fir/grouse whortleberry is a common habitat type.

P. Dominant Soils: Typic Cryopsamments, mixed. Soils have sandy loam and loam surface textures over loamy sand and sand subsurface textures and are moderately deep.

Q. Geologic Types: Hornblende-biotite granite

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	8.3
INTERMITTENT	2.6
EPHEMERAL	
OTHER (DEFINE)	

S. Transportation System:
Trails: *National Forest (miles):* 3.6 *Other (miles):*
Roads: *National Forest (miles):* *Other (miles):*
Airstrips: One

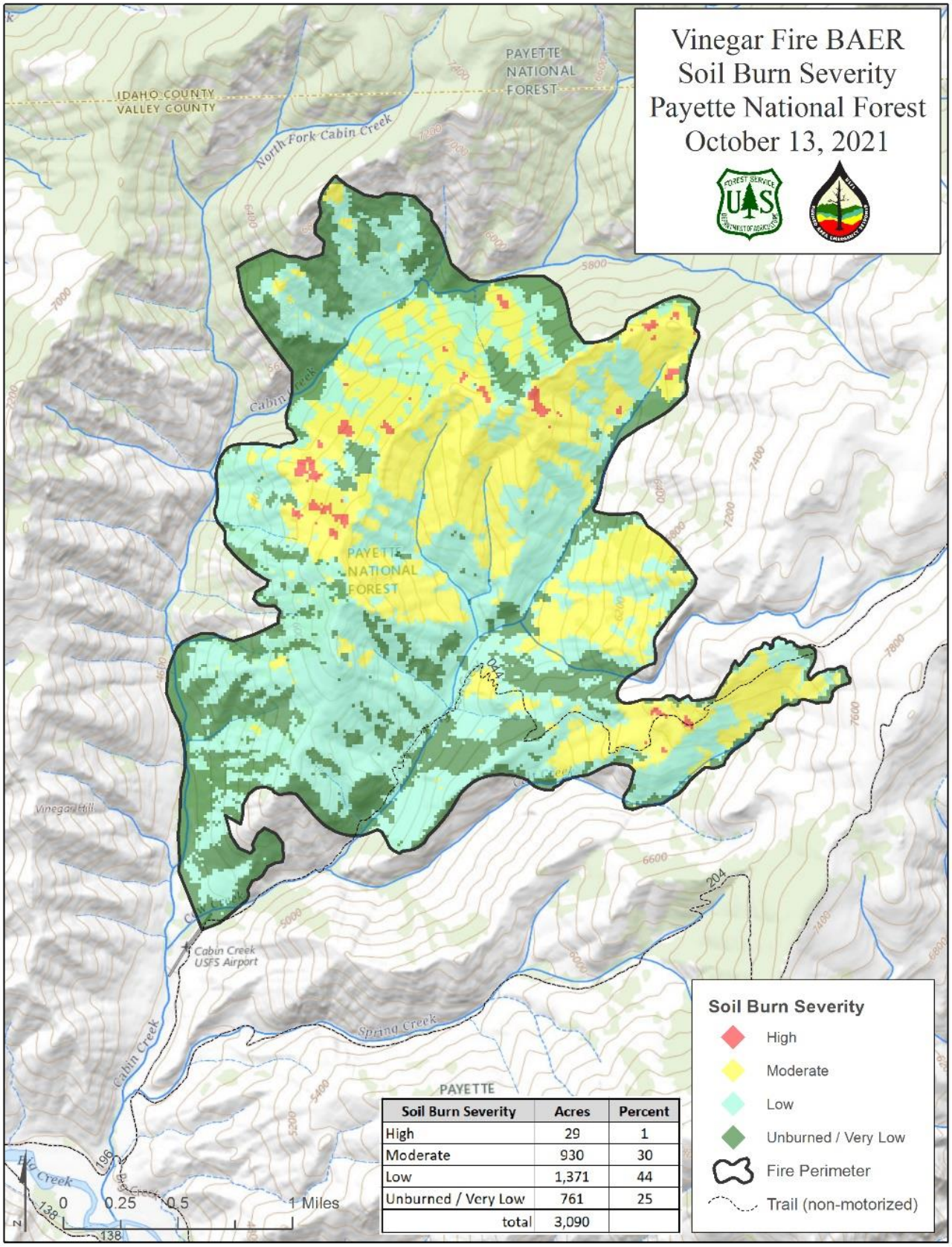
PART III - WATERSHED CONDITION

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	775					25
Low	1,353					44
Moderate	922					30
High	41					1
Total	3,091					100

Vinegar Fire Soil Burn Severity



PAYETTE

Soil Burn Severity	Acres	Percent
High	29	1
Moderate	930	30
Low	1,371	44
Unburned / Very Low	761	25
total	3,090	

B. Water-Repellent Soil (acres): Undetermined (no field validation). It is estimated that the high and moderate severity burn had some degree of water repellency and will influence erosion rates.

C. Soil Erosion Hazard Rating: Landtype-based erosion hazard ratings for the burned area are: Low 50 acres (2%), Moderate 2,738 acres (89%), High 302 acres (10%)

D. Erosion Potential: Landtypes consist of moderately dissected mountain slopes. Overland flow is rare and subsurface flow is concentrated quickly into draws. Slopes range from 40 to 60 percent**.** The fire area was analyzed for shallow landslide hazards using the PNF land slide prone (LSP) GIS map based on the landslide predictive model SINMAP (Pack et al. 1998). Modeling produces a stability index for each 30-meter topographic cell that are then grouped into four relative hazard classes: stable, low, moderate, and high. Land slide Prone (LSP) hazard rating within the fire perimeter is: Stable 905 acres (29%), Low 540 acres (17%), Moderate 450 acres (15%), High 1195 (39%).

E. Sediment Potential: Hillslope erosion and sediment transport was modeled for pre and post-fire conditions using WEPPCloud. WEPPCloud predicted a 38% increase in sediment yield post-fire compared to pre-fire conditions for a 10-year precipitation event (360 tons post-fire; 260 tons pre-fire), and a 43% increase in annual sediment discharge (330 lb/ac/yr post-fire; 230 lb/ac/yr pre-fire).

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

G. Estimated Hydrologic Response (brief description): It is reasonable to expect increased post-fire runoff in drainages with moderate to high soil burn severity, including Cow Creek. Hydrologic modeling of a 10-year, 24-hour precipitation event was performed for the Cow Creek watershed using Wildcat5, with the model predicting an increased discharge of 51% post-fire compared to pre-fire conditions.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Vinegar Fire was started by lighting on July 17th, 2021. It's located on Krassel Ranger District of the PNF and within the Frank Church River of No Return Wilderness. During the fire there was point protection of the historic Cabin Creek cabin that included burn out operations along the fire's southern boundary. These efforts primarily burned bunchgrass vegetation that resulted in low to very low Soil Burn Severity (SBS). The fire area is 3,091 acres and predominantly burned at a low to very low (SBS) within 60% of the fire perimeter and the remainder burned at a moderate severity.

Critical values and resource threats identified during the assessment include the Cabin Creek airstrip, trails, noxious weeds, and culturally sensitive heritage sites.

Cabin Creek airstrip suffered damage from a 1996 flood event. High flows overtopped the banks of Cow Creek and were diverted onto the Cabin Creek airstrip, eventually gullying out nearly the entire length of the airstrip. Review of the incident records on file concluded that floodplain modifications during runway construction were the primary cause of the stream diversion flowing down the runway. In 1998, the Forest Service completed a $100,000 project to rebuild the airstrip. Floodplain widening, bank stabilization, and other work was done to stabilize Cow Creek and contain flows to the flood prone area.

The Cabin Creek subwatershed, that includes Cow Creek, has had extensive fire history with the 2000 Diamond Complex Fire burning over the entire Vinegar Fire scar and the more recent 2008 Cabin Creek Fire burning over a portion of the Vinegar Fire. Review of the Diamond Complex Fire (2000), which burned 100% of the Vinegar Fire area, identified the Cabin Creek Airstrip as a primary value at risk. At that time, 78% of the Cow Creek watershed had burned at moderate to high soil burn severity and 45% of the watershed was rated as having a moderate to high potential for debris slides. Proposed BAER treatments to Cow Creek and the area around the airstrip were completed to protect these values. Twenty-five years have passed without incident since the initial airstrip damage occurred, with a few seasons of much greater than average

precipitation and runoff regionally, providing some confidence in the channel and floodplain treatments from the late 1990s and early 2000s

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**

1. **Human Life and Safety (HLS):**
2. **Property (P):Cabin Creek Airstrip:** There is a **High Risk** (possible, major) to the airstrip from Cow Creek high flows as a result of increased runoff from the burn area. The airstrip is located on Cow Creek alluvial debris fan. Storm inspection and response of Cow Creek and the airstrip prior to spring runoff will ensure Cow Creek remains clear of debris that could divert damaging stream flow onto the airstrip or adjacent side channels.

Trails: Approximately 3.6 miles of trail were impacted by the Vinegar Fire **(Figure 1).** Fire response hydrology driven by high, moderate, and low burn severity will increase risk of damage to trail prism and existing water-bars. Post-fire trail assessment identified log constructed waterbars as being burned that resulted in trail tread damage from post fire runoff **(Figure 2).** The fire has created conditions that potentially threaten the stability and integrity of the trail across all soil burn severity classes. There is a potential for further damage to the trail system due to runoff erosion in the next several years. Most of the damage is expected to occur during the emergency period of 1 year following fire. There are opportunities to limit the extent of trail loss with fall and early spring trail treatments in the first year following fire.

Emergency Determination**:** For threats to trails due to post fire erosion and run-off, the probability of damage or loss is Very Likely, and the magnitude of consequence is Moderate. Therefore, the BAER risk is **High**. 1.4 miles of trail were burned under moderate severity and 1.4 miles under low/very low severity and a negligible amount of trail fell in the high burn severity rating. The trail is in the Cow Creek watershed which has had extensive fire history with the 2000 Diamond Complex Fire and the more recent 2008 Cabin Creek Fire. Due to the frequent fire disturbance history over the last twenty years, soil erosion and runoff effects to trails would be intensified. Where the trail incurred moderate SBS the response would be as if it incurred High SBS and where trail incurred low SBS it would respond as if it incurred moderate SBS. This gives justification for trail treatments on the 1.4 miles of trail that intersect low SBS in addition to the 1.4 miles that intersected moderate SBS for a total of 2.8 miles of trail treatments.

Figure 1: Trails Impacted by fire Soil Burn Severity

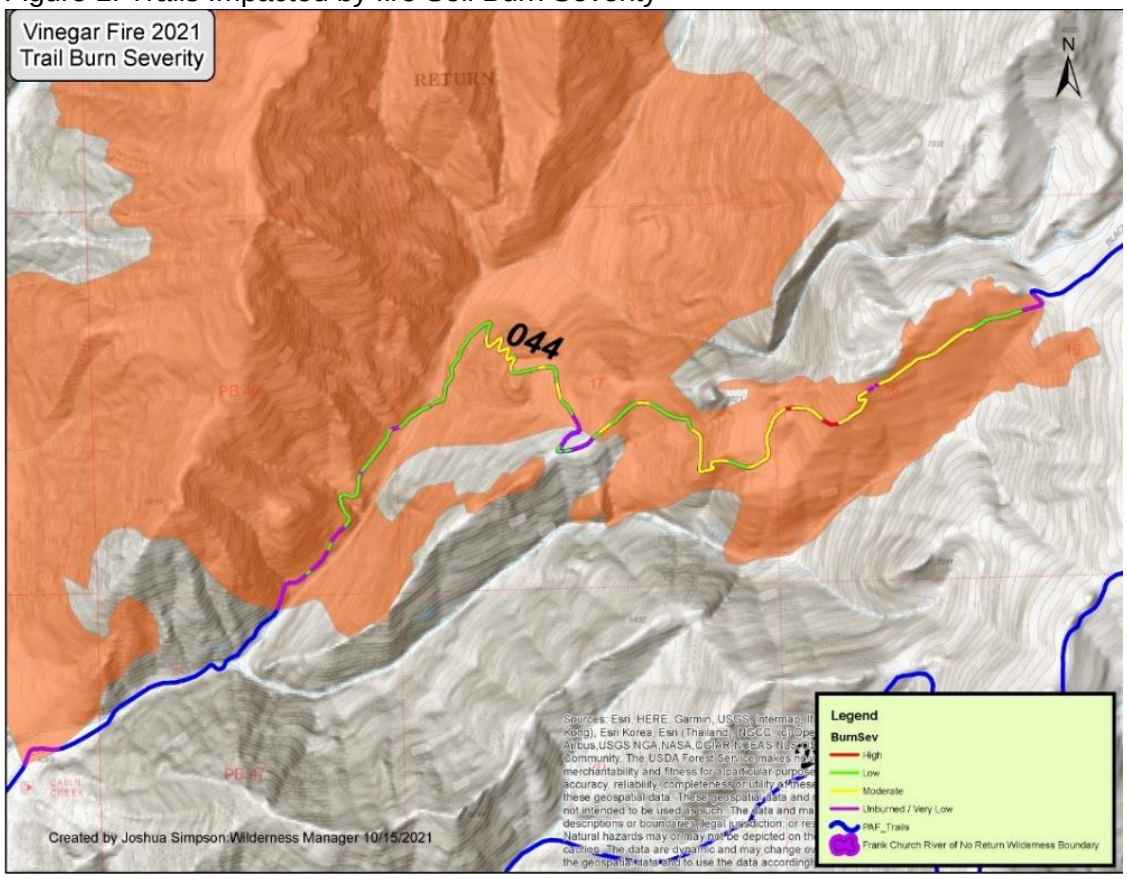


Figure 2: Impacted Trail and Waterbar

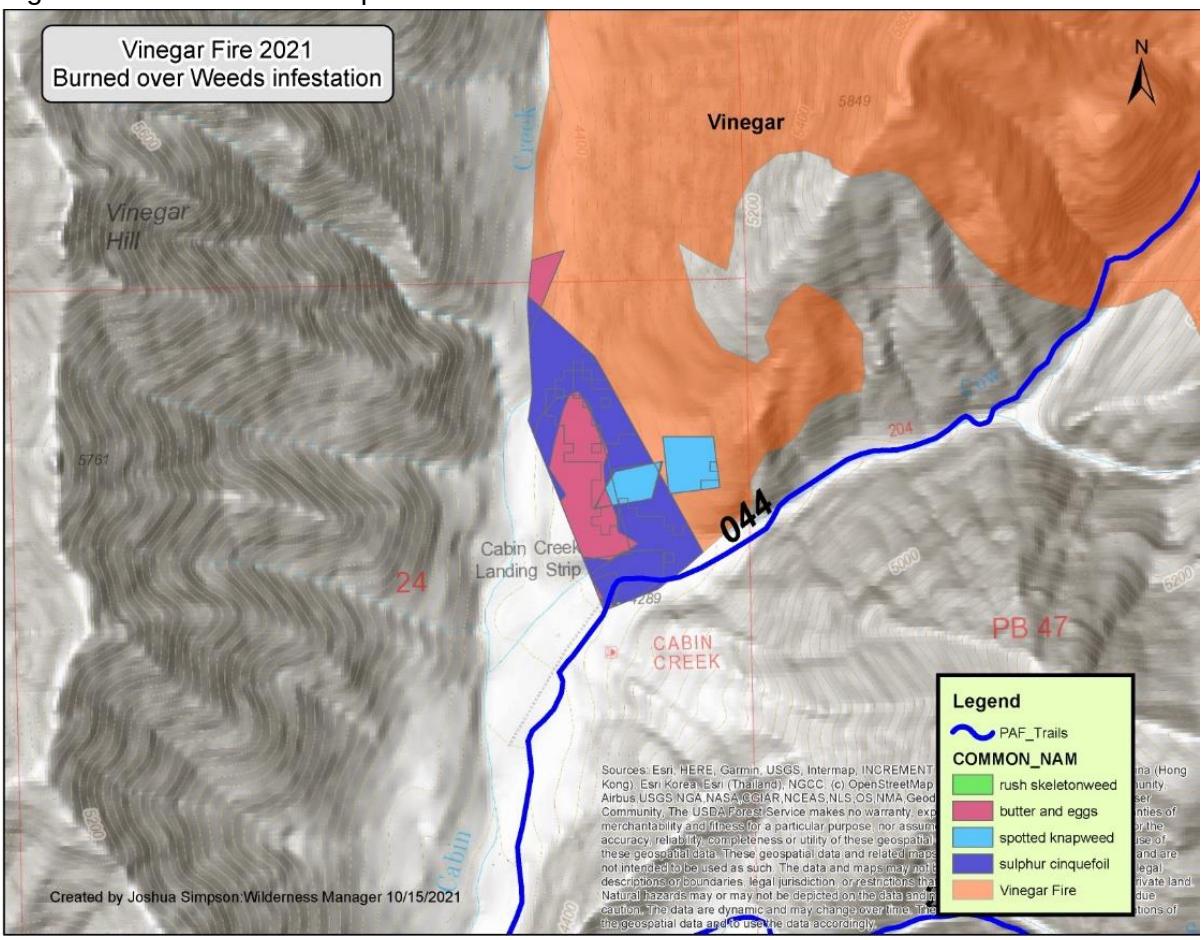
3. **Natural Resources (NR):**The noxious weeds, Rush skeleton weed (Chondrilla juncea), yellow toadflax (Linaria vulgaris), spotted knapweed (*Centaurea maculosa)* and Canada thistle (*Cirsium arvense)* currently infest about 800 acres in the immediate vicinity (less than 1000') from the Vinegar Fire perimeter. See Map. Significant threats to ecosystem integrity exist from the potential invasion of noxious weeds and invasive non- native plants within the Cabin Creek and Cow Creek drainages.

   Noxious weed invasion is expected in areas within burn areas because of the known sources along the NFS trails, an administration site, an airstrip and other areas within the fire perimeter. Infestations which have the highest likelihood of spreading to surrounding lands include hillsides within and immediately adjacent to the fire perimeter. Even where noxious weed species do not currently occur on the landscape, the threat will persist until native plants have had a chance to recolonize burned and disturbed areas. This could take several years.

   Emergency Determination: For threats from noxious weeds, the probability of damage or loss is Very Likely, and the magnitude of consequence is Major to Moderate. Therefore, the BAER risk is **Very High.** The spread of noxious weeds would adversely affect multiple resources including native plant communities which in turn affects threatened and endangered species habitat for wildlife, fisheries and plants. In addition, noxious weeds can alter natural plant communities in eligible wild and scenic river corridors. Currently, approximately 64 acres were burned **(Figure 3)**. Early season treatment throughout the main growing season will be needed to implement a timely and effective treatment response to this threat.

Probability of Damage or Loss	**Magnitude of Consequences**		
	Major	Moderate	Minor
	RISK		
Very Likely	Rush Skeletonweed, Yellow toadflax, Canada thistle, Spotted Knapweed spread = **Very High**	Spotted Knapweed spread, Canada thistle spread = **Very High**	**Low**
Likely	**Very High**	**High**	**Low**
Possible	**High**	**Intermediate**	**Low**
Unlikely	**Intermediate**	**Low**	**Very Low**

Figure 3. Noxious Weed Population within Fire Perimeter



4. **Cultural and Heritage Resources:**There is a **Low Risk** to cultural resources as a result of the Vinegar Fire. There are two recorded cultural resources eligible for listing on the National Register of Historic Places (NRHP) adjacent, but not within the Fire. These sites are located on flats and terraces within grasslands and ponderosa pine forest. Due to the burn and location conditions, cultural resources are not at risk as a result of the Vinegar Fire.

A. Emergency Treatment Objectives:

Cabin Creek Airstrip: Storm inspection and response of Cow Creek and airstrip after significant rain- on snow events and prior to spring runoff to ensure Cow Creek remains clear of debris that could divert stream flow onto airstrip or adjacent side channels. This response will reduce the threat of possible erosion damage to the airstrip.

Trails: Remove imminent safety hazards around treatment sites. Reestablish proper drainage and water management structures to prevent further loss to the Wilderness transportation infrastructure. Emergency trail work will be accomplished next spring and early summer prior to mid and late summer thunderstorms.

Noxious Weeds: Treat noxious weed infestations with herbicides or mechanically within the burn perimeter for one year following the fire. Treatment would occur on approximately 64 acres in and adjacent to the Vinegar Fire perimeter. Treatment outside of fire perimeter will be conducted as well, but through normal program of work project funding. Treatment will be done with backpack sprayers using chemicals and guidelines approved in the wilderness weed treatment EIS (USDA, 1999). Treatment near waterways will require hand removal of infestations to prevent water contamination.

Cultural Resources: Low threat, cultural resources have not been identified as being at risk.

B. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: 80%
Channel:
Roads/Trails: 80%
Protection/Safety: 80%

D. Probability of Treatment Success

Table 6: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
Land	80	90	90
Channel			
Roads/Trails	80	90	90
Protection/Safety	80	80	90

E. Cost of No-Action (Including Loss): 279,050

F. Cost of Selected Alternative (Including Loss): 33,400

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: John Dixon
Email: john.dixon@usda.gov **Phone(s)** W-208-634-0639 C-541-517-5120

Forest BAER Coordinator: Leigh Bailey
Email: Susan.Bailey@usda.gov **Phone(s):** 208-634-0793

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

Skill	**Team Member Name**
Team Lead(s)	John Dixon
Soils	John Dixon
Hydrology	John Dixon, Cameron Carsley (trainee)
Engineering	Ben Dreier
GIS	Cameron Carsley
Archaeology	Marielle Pedro Black
Weeds	Joshua Simpson
Recreation	Joshua Simpson
Fisheries	Caleb Zurstadt
Wildlife	Brian Davis
Botany	
Other	

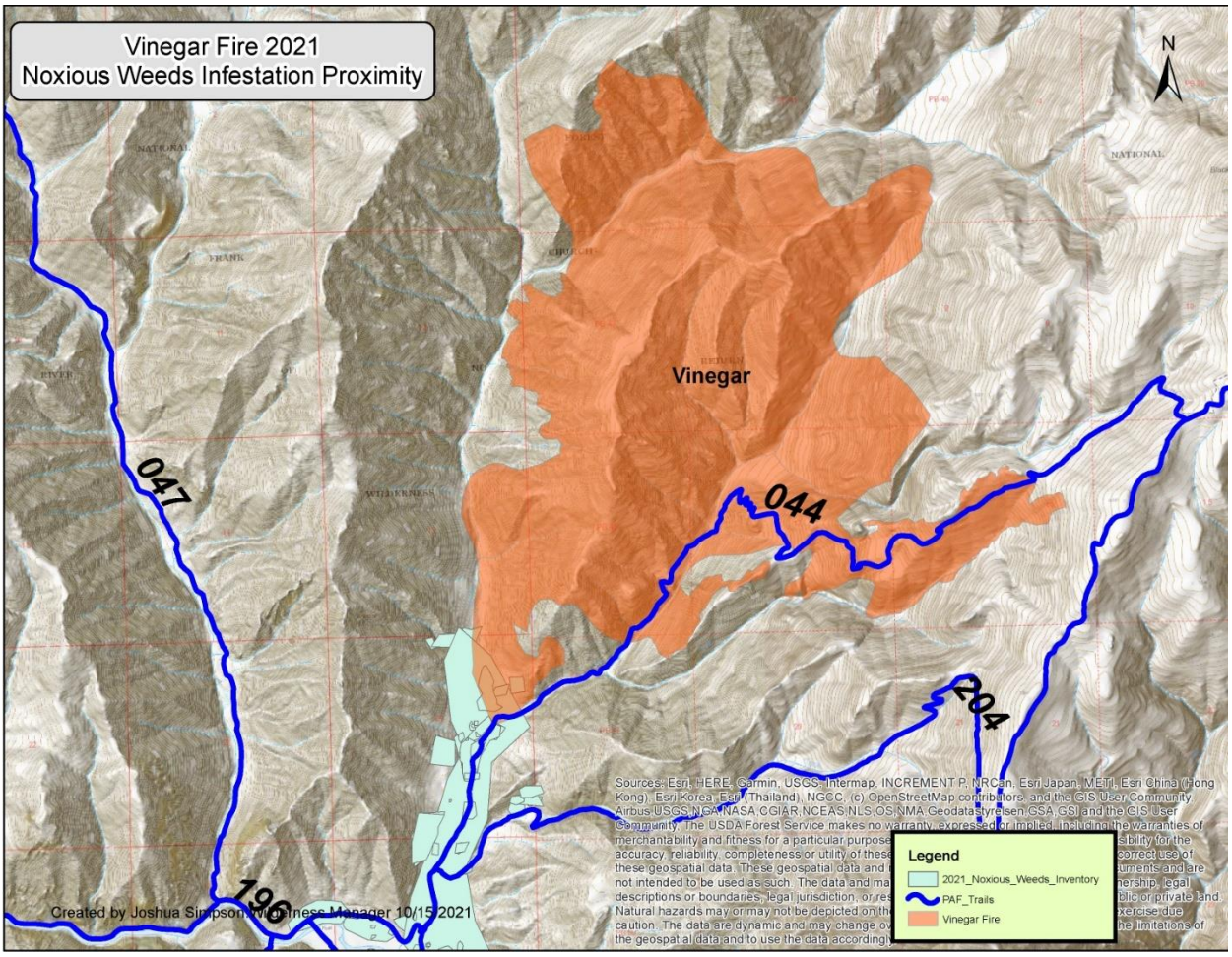
H. Treatment Narrative:

Land Treatments

Noxious Weeds: Herbicide Application work will utilize a Montana Conservation Corps (MCC) crew utilizing backpack sprayers and chemical herbicide mixed with water and applied to all infestations within fire perimeter. Species of concern include Rush skeletonweed, Spotted knapweed, Yellow toadflax, and Canada thistle. Sulphur cinquefoil and other increaser type species of weeds are also present and could be treated depending on occurrence density. The MCC crew will spend upwards of 1 hitch (10) days covering the entire infestation and ensuring adequate treatment application is conducted. Overall burned acres totaled 64 acres; however, these 64 areas are part of a much larger, `800-acre, contiguous infestation adjacent to the fire. Treatment will focus on the burned area.

Noxious Weeds Treatment Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Weeds Treatments (Agreement w/ Montana Conservation Corps)	Hitches	$12,000	1	$12,000.00



Channel Treatments: N/A

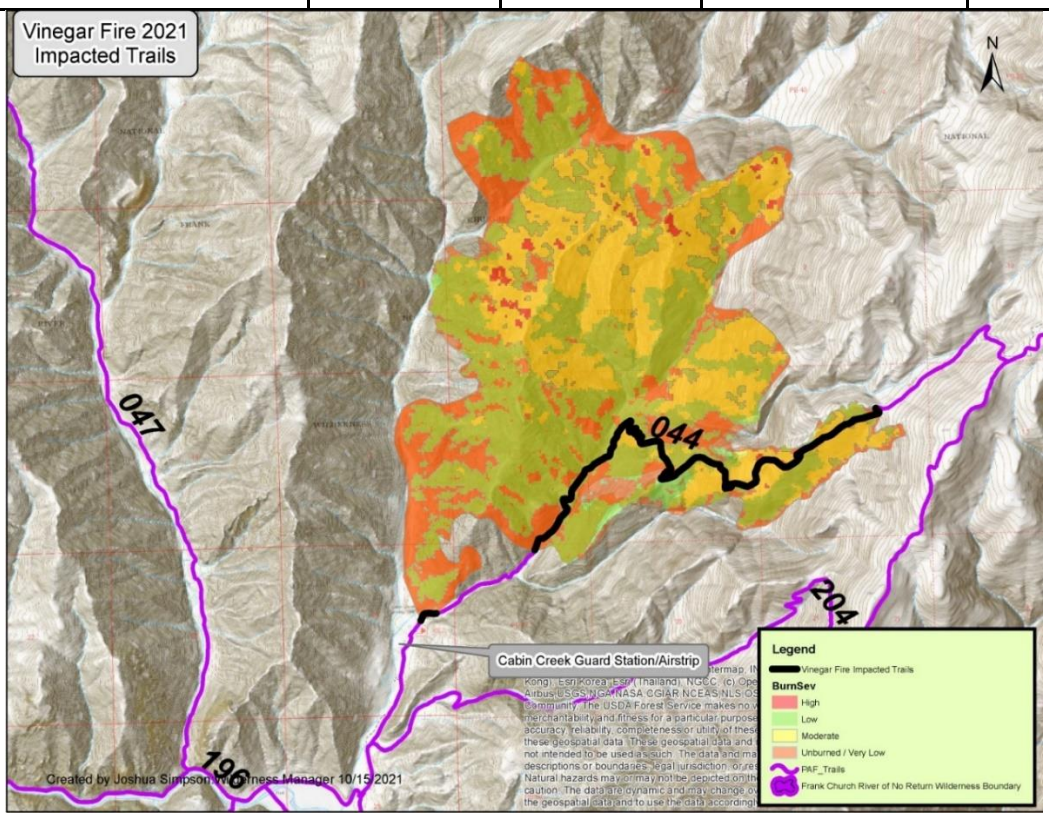
Roads and Trail Treatments:

Trail Infrastructure: Work will be conducted by one Montana Conservation Corps crew and will be in line with typical maintenance standards. All downed trees within the trail prism will be cut-out to current cut-back standards of 8' wide to accommodate stock users. All drainage structures will be evaluated for fire damage and replaced/repaired if they sustained damage. Drainage structures will receive heavy maintenance in order to adequately drain the trail tread as designed. Trail tread will be re-dug where necessary to address any slumping or tread failures associated with fire impacts. All rocks and other materials that have rolled out on to the trail or within the trail prism will be removed. Work will be preceded by a monitoring check to determine where to focus work and followed up with another day of monitoring to ensure all work was done to standard.

- Provide safe working space along the trail affected by the Vinegar Fire for WCC crews when doing stationary trail work.
- Clear trails impacted by fire of trees and rocks, repair drainage, and reconstruct tread where needed to access emergency treatment sites.
- Replace and install water diversions structures to accommodate runoff and reduce potential for trail washouts prior to the spring runoff.
- Remove debris slides material from trail.
- Remove debris accumulated behind bridge structures to prevent bank erosion and sedimentation.

Trail Treatment Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Trail Treatments (Agreement with Montana Conservation corps)	Miles	$5,000.00	2.8	$14,000.00

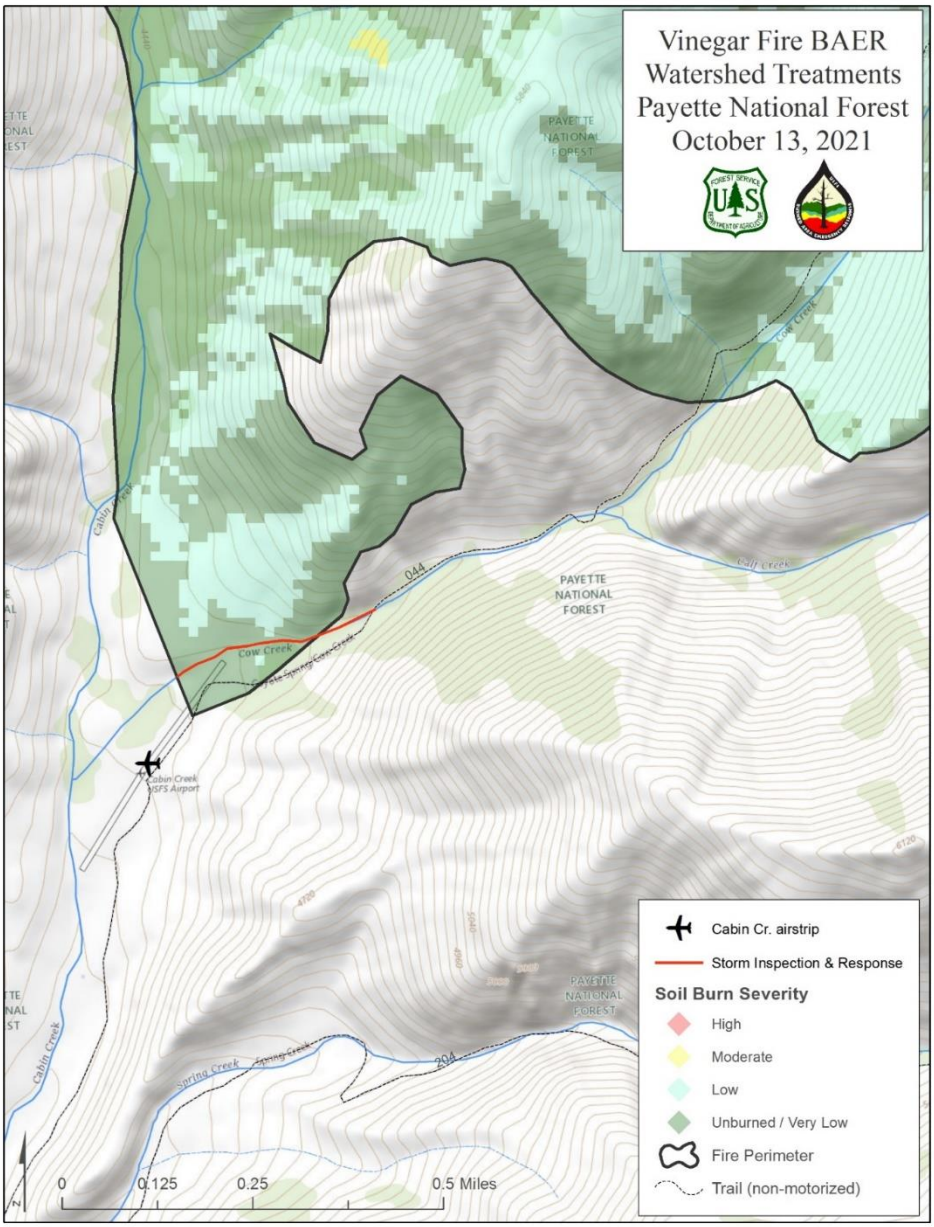


Protection/Safety Treatments:

Cabin Creek Airstrip: Post-storm inspection and response will require up to two flights into Cabin Creek airstrip. Inspection will focus on the section of Cow Creek above and adjacent to the airstrip to assure high flows will be contained within the current Cow Creek channel and not pose a threat to the airstrip. Post-storm response can include removal of stream channel debris jams and cutting riparian vegetation that threaten to divert Cow Creek flows out of its current channel.

Item	UOM	Unit Cost	# of Units	Total Cost
Air transportation	flights	$3,000	2	$6,000.00
Overtime	hours	$40.00	20	$800.00
Per Diem	days	$75.00	8	$600.00
				$7,4000

Post Storm Inspection and Response map of Cow Creek for protection of Cabin Creek Airstrip



I. Monitoring Narrative: N/A

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

A. Land Treatments										
Herbicide Application-Weed	Hitches	12,000	1	$12,000	$0		$0		$0	$12,000
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$12,000	$0		$0		$0	$12,000
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										
Trail Miles	Trail Miles	5,000	2.8	$14,000	$0		$0		$0	$14,000
					$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$14,000	$0		$0		$0	$14,000
D. Protection/Safety										
Airstip Storm Inspections and response	# of Site Visits	3,700	2	$7,400	$0		$0		$0	$7,400
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$7,400	$0		$0		$0	$7,400
E. BAER Evaluation										
Initial Assessment	Report	$3,000	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
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$33,400	$0		**$0**		**$0**	**$33,400**
Previously approved										
Total for this request				**$33,400**						

PART VII - APPROVALS

LINDA JACKSON

Digitally signed by LINDA JACKSON
Date: 2021.10.28 09:51:03 -06'00'

Forest Supervisor

10/28/21

Date