

Date of Report: December 9, 2022**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: Hurricane Ridge Wildfire****B. Fire Number: NC-NCF-220280****C. State: North Carolina****D. County: Haywood****E. Region: Region 8, Southeast****F. Forest: Pisgah N.F****G. District: Appalachian RD****H. Fire Incident Job Code: P8P4PU (0811)****I. Date Fire Started: 11/23/2022****J. Date Fire Contained: 12/08/2022****K. Suppression Cost: \$375,000****L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

- 1. Fireline repaired (miles):** 2 miles of system and old roadbeds
- 2. Other (identify):** None

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

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
060101060305	Cold Springs Creek-Pigeon River	28,415	796	2.8

N. Total Acres Burned:

The Hurricane Ridge wildfire was completely contained on the USFS on the Appalachian Ranger District (Table 2).

Table 2. Wildfire ownership

Ownership	Acres
NFS	796
Other Federal	0
State	0
Private	0
Total	796

O. Vegetation Types:

The vegetation types were determined based on current and previous field reconnaissance, previously mapped rare plant communities, mapped forest vegetation types, modeled and plotted plant communities, aerial imagery, and LiDAR derived canopy and shrub heights. Within the burn perimeters the elevation range varies from around 2,550 feet by Forest Service Road 233 near its southwestern boundary to 3,650 feet along Hurricane Ridge on its eastern perimeter. Only one stand has been harvested within the last 30 years present within the wildfire. It represents less than 2% of the wildfire. The majority of the wildfire vegetation types, 80% of the burn area, are from 80 years of age or older. Portions of three proposed harvest units are within the burn perimeter.

The dominant plant communities within the Hurricane Ridge wildfire were rich cove and dry-mesic oak forests, consisting of 40% and 29%, respectively (Table 3). The former type is primarily dominated by tulip poplar and has the greatest diversity of herbaceous understory. This observation is based on previous surveys here prior to the wildfire. Red oak, chestnut oak, white oak, a diversity of hickories, and white pines dominate the dry-mesic oak forest. Mesic oak forest is present, on adjacent slopes to the rich cove forests. It is dominated by red oak and white oak and a mostly open understory representing about 22% of the wildfire area. Acidic cove forest, represents 7% of the wildfire perimeter habitats. Like rich cove forest it is often dominated by tulip poplar but covered in the midstory and shrub layer with a dense evergreen *Rhododendron maximum* component and a sparse herb layer. Dry oak forest with dominant chestnut oak and scarlet oak underlain with a denser mountain layer was scattered on the upper ridge top and steeper ridges, representing a little more than 2% of the area. On the western perimeter of the fire, a few sharper ridges included scattered pitch pines and was classified as pine-oak/heath forest. It represents slightly less than 2% of the wildfire area. All of the types primarily experienced low fire severity.

Table 3. Vegetation types present within the wildfire.

Vegetation	Acres	Percent
Acidic Cove Forest	55	7.1%
Rich Cove Forest	313	40.4%
Dry-Mesic Oak	226	29.2%
Mesic Oak	168	21.7%
Dry Oak	19	2.5%
Pine-Oak/Heath	15	1.9%
Total	796	

No known occurrences of rare communities are documented or were observed within the wildfire perimeter. No rare species are known within the perimeter although one species, mountain catchfly (*Silene ovata*), occurs just on its perimeter on an upper road slope along Hurricane Creek Ridge Road. This area was not affected by the wildfire or the suppression activities.

P. Dominant Soils:

The following soils occur in the burned area, representing at least 10 acres:

- BsD—Brasstown-Junaluska complex, basin, 15 to 30 percent slopes
- BsE—Brasstown-Junaluska complex, basin, 30 to 50 percent slopes

- EdE—Edneyville-Chestnut complex, basin, 30 to 50 percent slopes, stony
- EdF—Edneyville-Chestnut complex, 50 to 95 percent slopes, stony
- EvE—Evard-Cowee complex, 30 to 50 percent slopes
- RfF—Rock outcrop-Ashe-Cleveland complex, 30 to 95 percent slopes
- SdD—Saunook loam, basin, 15 to 30 percent slopes, stony
- SoF—Soco-Stecoah complex, 50 to 95 percent slopes
- TuD—Tuckasegee-Cullasaja complex, 15 to 30 percent slopes, very stony

Soil Series	Acres	Percent
Urban	4	0.6%
BsD	28	3.6%
BsE	82	10.6%
EdD	1	0.1%
EdE	45	5.8%
EdF	337	42.3%
EvD	1	0.1%
EvE	53	6.6%
PwE	2	0.2%
PwF	9	1.1%
RfF	27	3.4%
SdC	4	0.5%
SdD	18	2.2%
SoF	144	18.1%
TrE	4	0.5%
TuD	33	4.1%
TvE	4	0.4%
WoD	2	0.3%
Grand Total	796	

All soils are “well drained” with a low susceptibility (K factor of 0.10 to 0.20) to sheet and rill erosion by water. The potential for damage by fire ranges from “Low” to “Moderate” for soils. These ratings are defined by NRCS as follows:

Damage by fire: The ratings in this interpretation indicate the potential for damage to nutrient, physical, and biotic soil characteristics by fire. The ratings involve an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

- Q. **Geologic Types:** The burned area is underlain by sedimentary and metamorphic rocks in the Wading Branch and Granodiorite gneiss Formations of the Blue Ridge Belt. (<https://ngmdb.usgs.gov/>)

R. Miles of Stream Channels by Order or Class:

Table 4: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	0.8
INTERMITTENT	0.5
EPHEMERAL	
OTHER (DEFINE)	

S. Transportation System:

Trails: *National Forest (miles):* 0
Roads: *National Forest (miles):* 2.7

Other (miles):
Other (miles):

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 5: Burn Severity Acres by Ownership

Soil Burned Severity	NFS	Other Federal	State	Private	Total	%
Unburned	0	0	0	0	0	0
Low	~ 100	0	0	0	100	100
Moderate	0	0	0	0	0	0
High	0	0	0	0	0	0
Total	100	0	0	0		

Aerial reconnaissance of the fire was conducted by the fire's operations staff and determined locations of varied fire intensity. A Burned Area Reflectance Classification (BARC) map was not requested. Sections of the fire were ground surveyed by the BAER Team on December 2nd, focusing on the most intensely burned areas and along roads known to have noxious weed concerns. The BAER field review determined little disturbance to the forest duff layer due to the low residence time of the fire in one give area. Exceptions were observed only where logs burned and retained heat for a longer time resulting in a localized loss of the litter layer, but in most cases the deeper organic layer remained intact as well as many fine roots.

B. Water-Repellent Soil (acres): No water-repellent soils were detected.

C. Soil Erosion Hazard Rating: 796 (low) 0 (moderate) 0 (high)

D. Erosion Potential: 0.04 tons/acre (From Disturbed WEPP Results)

E. Sediment Potential: 0.04 tons/acre (From Disturbed WEPP Results)

F. Estimated Vegetative Recovery Period (years): 1 year

G. Estimated Hydrologic Response (brief description): Soil erosion and movement from all burned areas is expected to be very minimal since soil burn severity was low over the entire burned area. A portion of the area within the burn did not burn resulting in a mosaic of burned and unburned areas.

PART IV - HYDROLOGIC DESIGN FACTORS

Hydrologic treatments were not determined to be a critical need since the burned area experienced predominantly a low burn severity, leaving much of the forest litter layer and forest intact. Over much of the burned area, a mosaic of burned and unburned conditions exist. The predominant change noted was a loss of the very top surface leaf layer, without a notable loss of low to mid-story vegetation. Based on past monitoring data, it is assumed that the burned understory will recover within the year as plants emerge and resprout where they were top-killed.

Therefore, notable increases in water yield and peak flows are not expected since vegetation will recover and overland flow is not expected to increase, due to the remaining forest duff layer. Erosion and sediment hazards are expected to be minimal due to the limited amount of mineral soil exposed. This assumption was validated on previous wildfires where the duff layer remained intact and no soil movement was observed from several surveyed locations. Therefore, soil and slope treatments are not recommended, and modifying road/stream crossings is not necessary.

PART V - SUMMARY OF ANALYSIS**Introduction/Background****A. Describe Critical Values/Resources and Threats (narrative):****Table 2: 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

Table 6 is a summary of the values within the Hurricane RidgeWildfire, as well as, the threats to those values, the probability of damage or loss, magnitude of consequences and the resulting level of risk. The matrix in Table 5 was used to evaluate the final risk assessment. Pink shaded cells are those values that rated out as “very high” or “high” risk. Yellow shaded cells rated out “intermediate” risk and white cells rated out “low” or “very low”.

Table 6. Values and Values At-risk

Value	Value at Risk	Threat to Value at Risk	Probability of Damage or Loss	Magnitude of Consequence	Risk	Treatment	Notes
Natural Resources	Native plant communities (rich cove and mesic oak forests) where invasive plants are documented in minor amounts along Hurricane Ridge Road and within portions of the wildfire	Spread of invasive plants into native habitats. Known species with documented control is garlic mustard (<i>Ailaria petiolata</i>), multiflora rose (<i>Rosa multiflora</i>), tree-of-heaven (<i>Ailanthus officinalis</i>), princess tree (<i>Paulownia tomentosa</i>), and coltsfoot (<i>Tussilago farfara</i>)	Likely	Moderate	High	Early Detection and Rapid Response	Concern for known infestations increasing their spread across 100 at-risk acres. Action to monitor in early spring, if response seen, request treatment funds for early treatment
Natural Resources	marked timber within three units	Loss of commercial value due to wildfire	Possible	Minor	Low	None	N/A
Human Life and Safety	Human Life and safety along Hurricane Ridge road (FSR 233)	Hazard Trees adjacent to road pose threat to life	Unlikely	Major	Intermediate	None	No actions are recommended since it is a permanently closed road, few people traverse it, and hazards trees were cut adjacent to the road as part of the suppression efforts
Property	Roads and culverts only known property	Threat from fallen trees and blocked culverts	Unlikely	Minor	Very Low	None	no risk due to erosion and hazard trees minimal
Cultural	None known or documented	No Threat	Unlikely	Minor	Very Low	None	N/A

- 1. Human Life and Safety (HLS): Intermediate** – The probability of loss of human life is unlikely due to very little traffic, but the magnitude of consequences could be major. As a result, there is an intermediate risk to human life and safety. However given the remote location no actions are recommended.
- 2. Property (P): Very Low** – The probability of damage or loss of Forest Service property is unlikely and the magnitude of consequences are minor, resulting in a very low risk to property. There is minimal infrastructure in close proximity to the burned area other than Forest roads. Only the Forest Service roads below the fire are at risk of washing and stream crossing culverts could become obstructed by debris, resulting in stormflows damaging road infrastructure.
- 3. Natural Resources (NR): Low** – There is possible damage to the commercial value of the marked trees within portions of 3 harvest units within the wildfire area. However, the magnitude of consequences is minor resulting in a low risk.
 - b. High** – The probability of damage or loss of natural resources is likely, and the magnitude of consequences would be moderate, resulting in a high risk to natural resources. Non-native

invasive plant species have been documented within and around the burned area that could now propagate readily within the burned area, increasing infestations from 5 separate species.

- 4. Cultural and Heritage Resources: Very Low** – The probability of damage or loss of cultural resources is unlikely given the low fire intensity, with the magnitude of consequences being minor, resulting in a very low risk of damage or loss of cultural resources. Resources are not documented from the fire area. **Emergency Treatment Objectives:** Prevent undesirable loss of native plant communities through early detection and rapid response of non-native invasive plant species (NNIS).

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

Land: The damaging event for non-native invasive plants is seed set, often dense, or root propagation. Surveying for the presence of, and treating infestations of NNIS species has proven to be a successful mitigation strategy to prevent adverse effects of NNIS species to native plant communities.

Channel: None Recommended

Roads/Trails: None Recommended

Protection/Safety: None Recommended

D. Probability of Treatment Success

Table 7: Probability of Treatment Success

	1 year after treatment	3 years after treatment	5 years after treatment
Land	75%	90%	95%
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): In the absence of treatment of NNIS species within and adjacent to the burned area, it is reasonable to expect populations of NNIS to grow and invade existing native plant communities. It is therefore reasonable to expect that the cost of NNIS treatments would increase over time as evidenced by National Forests throughout the U.S. that have very active and costly NNIS programs. The cost of future NNIS mitigation within and adjacent to the Hurricane Ridge burned area cannot be predicted with certainty, but a cost of \$300.00 per acre to survey and treat infestations (a reasonable cost) would be greater than \$35,000.

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: Brady N. Dodd

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Forest BAER Coordinator: Brady N. Dodd

Email: brady.dodd@usda.gov

Phone(s): (828)620-3176

Team Members: Table 3: BAER Team Members by Skill

Skill	Team Member Name
Team Lead(s)	Brady Dodd
Soils	Brady Dodd/Gary Kauffman

Skill	Team Member Name
<i>Hydrology</i>	Brady Dodd
<i>Engineering</i>	Brady Dodd
<i>GIS</i>	Gary Kauffman
<i>Archaeology</i>	N/A
<i>Weeds</i>	Sue Fruchey/Gary Kauffman
<i>Recreation</i>	N/A
<i>Other</i>	David McFee, James DelaRiva

H. Treatment Narrative:

Land Treatments: The proposed action is to survey and treat NNIS species within and adjacent to the burned area to prevent spread of infestations (i.e., Early Detection and Rapid Response). Infestations are known from surveys performed during the 12-Mile Environmental Analysis period. Species that are documented within the fire area include garlic mustard, multiflora rose, princess tree and tree-of-heaven. These primarily occur along Hurricane Ridge Road (FSR 233). Coltsfoot is known from nearby, but not directly in the fire area. These species are known to rapidly establish in areas with exposed soil. Some areas in the burn had soil exposure, and it would be important to assess any spread of known NNIS populations. Surveys would be conducted in Spring 2023 to assess the density of NNIS populations with plan for treatment in Spring (garlic mustard and coltsfoot) through summer and Fall (multiflora rose, tree-of-heaven, and princess tree) 2023.

Survey and potential treatments will focus on acreage downslope of Hurricane Ridge Road (FSR 233) . A total of 200 USFS acres will be surveyed (see figure below) and treated if any other non-native invasive plant species is located. We estimate 40 acres may need to be treated. Total treatment and survey request for Hurricane Ridge is \$15,300.

Treatment	Units	Unit Cost	# of Units	Total Cost
Invasive Plant Surveys/detection	acres	\$30	200	\$6,000
Invasive Plant Treatments	acres	\$200	40	\$8,000
Herbicide	gallons	\$100	3	\$300
COR contract development/review	acres	\$25	40	\$1,000



			NFS Lands				Other Lands			All
		Unit	# of		Other		Fed	# of	Non Fed	
Line Items	Units	Cost	Units	BAER \$	\$	# of units	\$	Units	\$	Total \$
A. Land Treatments										
NNIS Survey		30	200	\$6,000	\$0		\$0		\$0	\$6,000
NNIS Treatment		200	40	\$8,000	\$0		\$0		\$0	\$8,000
Herbicide		100	3	\$300			\$0		\$0	\$300
COR/Agreement Review		1,000	1	\$1,000			\$0		\$0	\$1,000
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$15,300	\$0		\$0		\$0	\$15,300
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										
Lead/ Forest Hydrologist	hours	\$74	0	---	\$0		\$0		\$0	\$0
NFsNC Botanist	hours	\$73	4	\$293	\$0		\$0		\$0	\$0
Pisgah NF Botanist	hours	\$56	5	\$281						
Overtime	hours	\$111	15.5	\$1,721						
Insert new items above this line!				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				\$2,294	\$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				\$17,594	\$0		\$0		\$0	\$15,300
Previously approved										
Total for this request				\$17,594						

PART VII - APPROVALS

1.	_____	12/15/2022
	District Ranger, Appalachian Ranger District	Date