Date of Report: 8/28/2024

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: Retreat Fire

B. Fire Number: WA-SES-000477

C. State: Washington

D. County: Yakima

E. Region: R6

F. Forest: Okanogan-Wenatchee

G. District: Naches

H. Fire Incident Job Code: PNR4FC24 (1522)

I. Date Fire Started: 2024-07-23

J. Date Fire Contained: 2024-10-31

K. Suppression Cost: $27,000,000 (projected)

L. Fire Suppression Damages Repaired with Suppression Funds (estimates): Not initiated at the time of this assessment.

1. **Fireline repaired (miles):** N/A
2. **Other (identify):** N/A

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170300020205	Little Rattlesnake Ck.	16,191	33	0.03
170300020308	Lower Tieton River	28,427	18,197	64
170300020310	North Fork Cowiche Ck.	25,042	6,652	27
170300020307	Oak Creek	20,053	19,580	98
170300020309	South Fork Cowiche Creek	24,243	289	1.2
170300020309	South Fork Cowiche Ck.-Cowiche Ck.	27,355	30	0.1
170300020208	Waterworks Canyon-Naches River	21,594	27	0.1

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

Land Ownership	Soil Burn Severity				Total Acres	Percent
	High	Moderate	Low	Very Low or Unburned		
Bureau of Reclamation		0.1	19	7	27	<1%
Private	153	643	2,967	1,941	5,704	13%
State	687	4,215	12,098	5,493	22,493	49%
U.S. Forest Service	866	3,547	8,930	4,114	17,458	38%
Grand Total	**1,706**	**8,405**	**24,015**	**11,555**	**45,681**	**100%**

O. **Vegetation Types:** Lowest elevations contain white oak *(Quercus garryana),* ponderosa pine (*Pinus ponderosa*) and black cottonwood (*Populus trichocarpa*) along the Tieton River with patches shrub steep communities, sagebrush (*Artemisia arbuscula*) and bunchgrasses (*Pseudoroegneria spicata*). The mid-elevations are dominated by Douglas fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*) and ponderosa pine. The mid to upper elevations contain larch (*Larix occidentalis*), subalpine fir (*Abies lasicocarpa*) and lodgepole pine (*Pinus contorta*). Ridge tops contain the federally threatened tree species whitebark pine (*Pinus albicaulis*). Many unique habitats exist throughout the fire perimeter including basalt rock outcrops, talus slopes, dry, mesic and wet meadows.

P. **Dominant Soils:** Within the Retreat Fire perimeter, skeletal soils dominate due to the steep slopes and unstable underlying parent rock. There is a wide range of soil types due to the variability of ecotype ranging from grasslands and open pine-oak in the eastern end to wet mixed conifer along the western ridges. Mollisols, defined by their substantial organic rich surface horizons, are more common in the grasslands and open conifer stands. Inceptisols, defined by their poor development, dominate the steeper areas along the ridges where the closed mixed conifer stands are more commonly found. The steep areas are also marked with landslide features old and new throughout the fire area. Erosion potential is generally moderate to high in the over steepened mountain slopes but due to the high amount of rock content and broken mountain slopes, the erosion potential will be tempered.

Q. Geologic Types: The geology underlying the Retreat Fire burn area represents varying ages of stratified volcanic units deposited over the past 28 million years. The oldest rocks in the burn area are Oligocene andesite lavas and lahar deposits of the Fifes Peak formation. Middle Miocene-age Grand Ronde formation from the Columbia River Basalt group forms most of the columnar cliffs along the hillsides on both sides of the Tieton River. The youngest lava flows are visible in exposures of the Tieton Andesite which erupted ~1 million years ago during the Pleistocene. One of the Tieton Andesite lava flows, which originated at the Goat Rocks Wilderness Area, flowed ~46 miles through the Tieton and Naches River valleys, making it the longest Andesite lava flow in the world.

Quaternary landslides and alluvial deposits comprise most of the surficial material throughout the burn area. Large deep-seated landslide complexes are visible in lidar along the south-facing hillsides of Oak Creek. Many of the steep drainage basins feeding the Tieton River contain shallow earth flows and rockfall talus from basalt exposures. These are the source materials for debris flow deposits found on many of the alluvial fans at basin outlets.

Geologic conditions in this area reflect a history of landslides, rockfall, flooding and debris flows. USGS post-wildfire debris flow models indicate that there are Low, Moderate and High debris flow hazards in drainages throughout the Retreat burned area. The models highlight several basins along the southern hillside of the Tieton River as High debris flow hazards that may remain elevated for years after the fire.

References: Walsh, T. J., 1986, Geologic Map of the west half of the Yakima quadrangle, Washington: Washington Division of Geology and Earth Resources Open File Report 86-4, 1 sheet, scale 1:100,000, with 9 p. text. Wall, K. T.; Grunder, A. L.; Miggins, D. P.; Coble, M. A., 2018,

Multistage growth and compositional change at the Goat Rocks volcanic complex, a major Pliocene–Pleistocene andesite center in the southern Washington Cascades. In Poland, M. P.; Garcia, M. O.; Camp, V. E.; Grunder, Anita, editors, Field volcanology: A tribute to the distinguished career of Don Swanson: Geological Society of America Special Paper 538, p. 637–92.

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

Table 3: Miles of Stream Channels by Order or Class. Note "Artificial Path" are streams that flow through NHD Area polygons as with large rivers and can be considered Perennial. All "Artificial Path" stream segments through NHD waterbodies (i.e., lakes, swamp/marsh, etc.) were not included in the totals.*

STREAM TYPE	MILES OF STREAM
PERENNIAL	76.71
INTERMITTENT	132.43
EPHEMERAL	12.06
ARTIFICIAL PATH*	15.77
CANAL/DITCH	9.59

S. **Transportation System**:

Trails: *National Forest (miles):* 14.4 *Other (miles):*

Roads: *National Forest (miles):* 93.88 *Other (miles):* 92.31

Roads in Retreat Fire by Soil Burn Severity (SBS)					
Operational Maintenance Level	**High SBS**	**Moderate SBS**	**Low SBS**	**Very Low or Unburned SBS**	**Grand Total**
1 - BASIC CUSTODIAL CARE (CLOSED)	0.58	4.17	5.00	0.94	10.68
2 - HIGH CLEARANCE VEHICLES	2.46	6.86	31.94	20.25	61.52
3 - SUITABLE FOR PASSENGER CARS	0.06	2.72	12.38	6.51	21.68
Total FS Roads	**3.10**	**13.75**	**49.32**	**27.70**	**93.88**
Non-FS Roads	1.24	6.11	41.88	43.08	92.31
Grand Total	**4.34**	**19.87**	**91.20**	**70.78**	**186.19**

Trails in Retreat Fire by Soil Burn Severity (SBS)							
Trail Number	**Trail Name**	**Land Ownership**	**Soil Burn Severity**				**Grand Total**
			High	**Moderate**	**Low**	**Very Low or Unburned**	
1146	COW CANYON	State	-	0.1	0.6	0.4	1.1
		USFS	-	0.6	2.4	1.9	4.9
1146 Total			***-***	***0.7***	***3.0***	***2.2***	***6.0***
4W325A	BETHEL RIDGE	USFS	-	0.6	1.1	1.3	2.9
4W325A Total			***-***	***0.6***	***1.1***	***1.3***	***2.9***
4W652	BETHEL OAK	USFS	-	0.5	1.6	2.3	4.4
4W652 Total			***-***	***0.5***	***1.6***	***2.3***	***4.4***
4W671	BETHEL - LYNN LAKE TIE	USFS	0.1	0.1	0.7	0.1	1.0
4W671 Total			***0.1***	***0.1***	***0.7***	***0.1***	***1.0***
4W672	BETHEL	USFS	-	0.4	0.3	0.6	1.2
4W672 Total			***-***	***0.4***	***0.3***	***0.6***	***1.2***
Grand Total			**0.1**	**2.3**	**6.7**	**6.5**	**15.5**

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

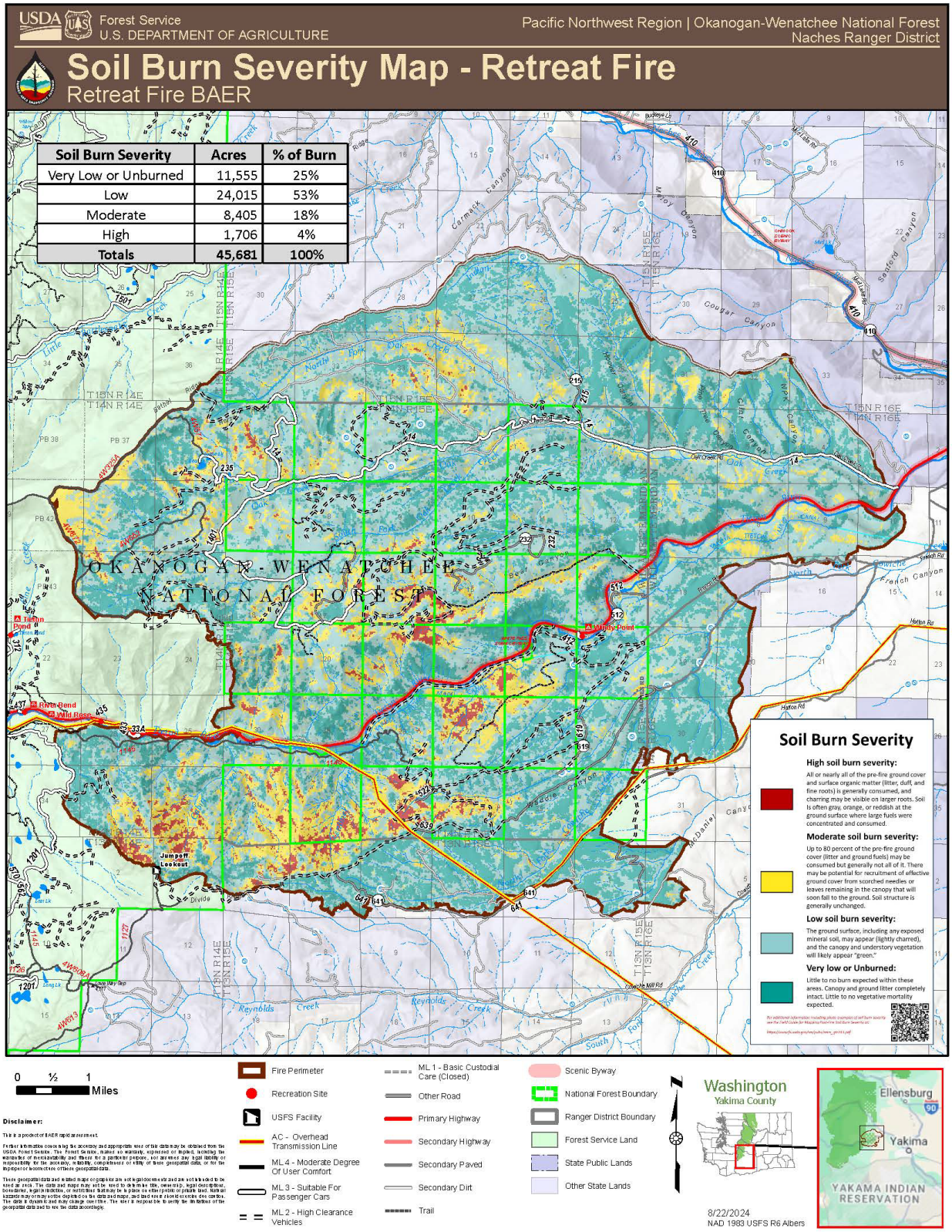
USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE
Pacific Northwest Region | Okanogan-Wenatchee National Forest
Naches Ranger District
Soil Burn Severity Map - Retreat Fire
Retreat Fire BAER
Soil Burn Severity | Acres | % of Burn
Very Low or Unburned | 11,555 | 25%
Low | 24,015 | 53%
Moderate | 8,405 | 18%
High | 1,706 | 4%
Totals | 45,681 | 100%
OKANOGAN-WENATCHEE
NATIONAL FOREST
Soil Burn Severity
High soil burn severity:
All or nearly all of the pre-fire ground cover and surface organic matter (litter, duff, and fine roots) is generally consumed, and charring may be visible on larger roots. Soil is often gray, orange, or reddish at the ground surface where large fuels were concentrated and consumed.
Moderate soil burn severity:
Up to 80 percent of the pre-fire ground cover (litter and ground fuels) may be consumed but generally not all of it. There may be potential for recruitment of effective ground cover from scorched needles or leaves remaining in the canopy that will soon fall to the ground. Soil structure is generally unchanged.
Low soil burn severity:
The ground surface, including any exposed mineral soil, may appear (lightly charred), and the canopy and understory vegetation will likely appear "green."
Very low or Unburned:
Little to no burn expected within these areas. Canopy and ground litter completely intact. Little to no vegetative mortality expected.
0 ½ 1 Miles
Disclaimer:
Fire Perimeter
Recreation Site
USFS Facility
AC - Overhead Transmission Line
ML 4 - Moderate Degree Of User Comfort
ML 3 - Suitable For Passenger Cars
ML 2 - High Clearance Vehicles
ML 1 - Basic Custodial Care (Closed)
Other Road
Primary Highway
Secondary Highway
Secondary Paved
Secondary Dirt
Trail
Scenic Byway
National Forest Boundary
Ranger District Boundary
Forest Service Land
State Public Lands
Other State Lands
Washington
Yakima County
Ellensburg
Yakima
YAKAMA INDIAN RESERVATION
8/22/2024
NAD 1983 USFS R6 Albers

Table 3: Burn Severity Acres by Ownership

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Grand Total	**1,706**	**8,405**	**4,015**	**11,555**	**45,681**	**100%**

B. Water-Repellent Soil (acres): Fire-induced or altered hydrophobicity is estimated to have occurred on approximately 22% of soils (100% of severely and moderately burned soil) or around 10,111 acres. Inherent moderate to strong hydrophobicity was noted during field observations, which could contribute to higher amounts of water repellent soils not induced by fire. Areas with fire adapted vegetation types and high lignin content, are assumed to have influenced increased hydrophobicity throughout the fire.

C. Soil Erosion Hazard Rating:

Soil Erosion Risk	Acres	Percent
Low	12,512	27%
Moderate	24,871	55%
High	6,762	15%
Very High	1,536	3%
Grand Total	**45,681**	**100%**

D. Erosion Potential: 0.2 tons/acre/year

E. Sediment Potential: 0.3 tons/acre/year

F. Estimated Vegetative Recovery Period (years): 3 Years

G. Estimated Hydrologic Response (brief description): Average annual precipitation for the area ranges from about 14 – 57". Summer thunderstorms are typically localized and of short duration and high intensity. Fall and winter storms are typically Pacific maritime frontal storms dominated by rain at these elevations from mid – October through mid – November. Fall rainstorms are typically low intensity and long duration. Snowfall accumulation and rain – on – snow events are common, typically occurring from November through January. The Retreat Fire burned entirely within the Tietan River – Naches River 10-Digit Hydrologic Unit Code (HUC) watershed. The fire perimeter covered the entire Oak Ck 12-Digit HUC watershed as well as portions of four other HUC-12 watersheds.

The entire Tietan River system is highly regulated by management and flow releases from the Tietan Dam and Rimrock Lake operated by the US Bureau of Reclamation upstream of the fire area. As is common in western river systems winter and spring runoff is retained in mountain reservoirs for release to lower elevation uses during the dry summer and fall months. The natural annual hydrograph for these systems has essentially been inverted – winter/spring streamflow's are depressed, and summer/fall seasons have streamflows much higher than they naturally would. Flood events and very low flows are also significantly removed from these controlled systems. And dams and reservoirs have major implications for fish and aquatic population viability. The Tietan River has historically supported populations of Pacific Salmon (e.g., Chinook, Steelhead), Bull Trout, and other species.

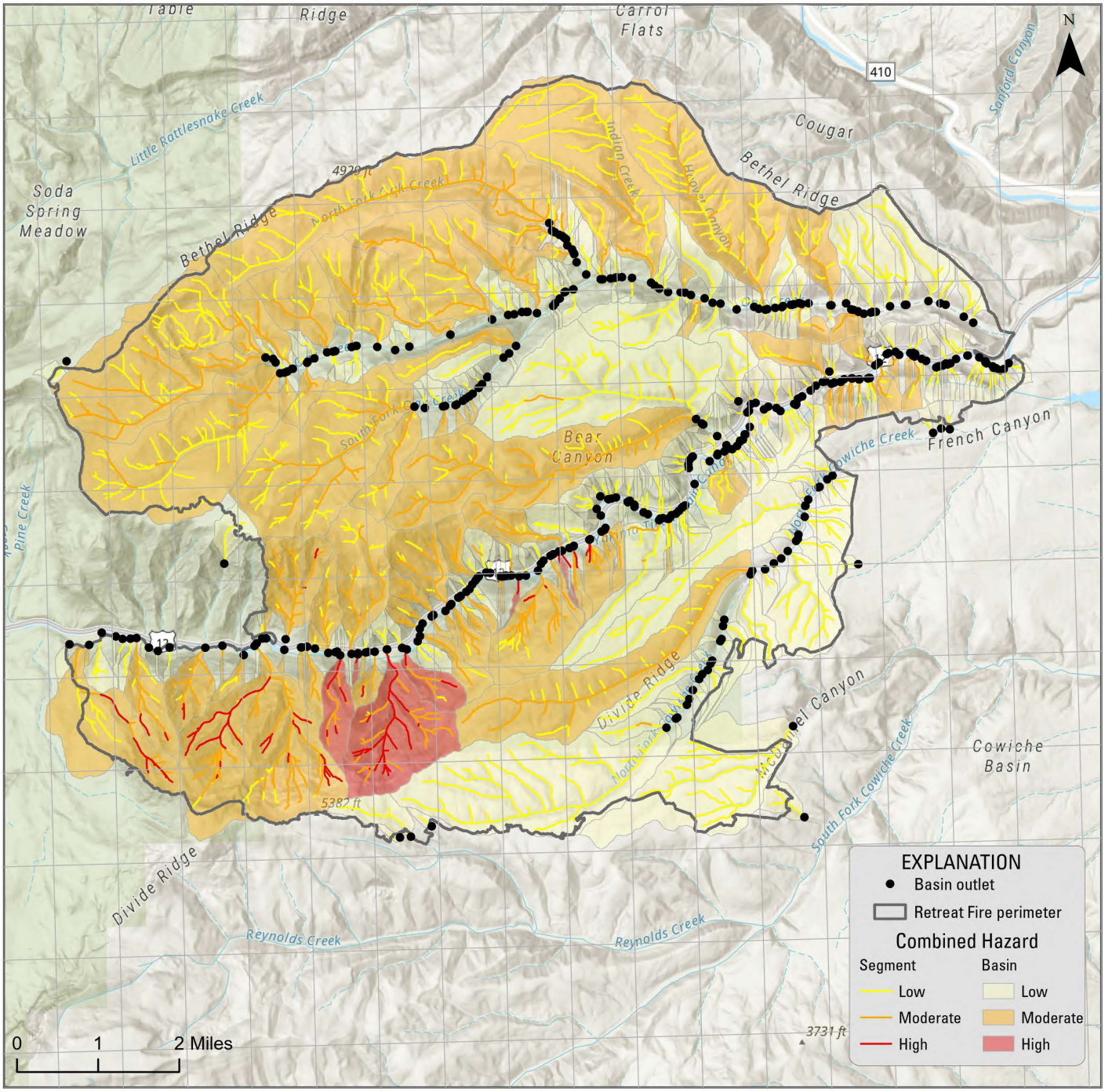
The Wildcat5 Rainfall-Runoff Hydrograph Model was used to predict pre- and post-fire flood peaks at a series of watershed pour points corresponding with road infrastructure or below large areas of high vegetation mortality and moderate and high SBS. Generally, both moderate and high soil burn severity display similar hydrologic response to storm events. Areas burned with long residence times have little to no effective ground cover and much of the duff and leaf and needle material that prevents soil particle detachment has been consumed. Soil water repellency appeared in many surveyed areas and natural background repellency was common, as expected in volcanic soils during the dry season.

Wildcat5 model results indicate a range of potential effects for the analyzed pour points. Pour points that demonstrated the largest increases in post-fire peak flow (5 Year, 24 Hour storm) were at the mouths of Cabin and Sentinel Creeks. However, these watersheds are un-roaded and do not have any infrastructure at increased risk of flood damage post-fire. Estimates of post-fire increased peak flows were also considerable at some road crossings in the Oak Creek watershed.

With this stated it is important to recognize that post – fire flooding in this region is frequently characterized by debris flows – a flooding mechanism that is not simulated with Wildcat5 peak flow modeling. USGS debris flow models were run for the entire Retreat Fire area. Results correspond well with hydrologic modeling in that Sentinel Creek and to some extent Cabin Creek show the highest probability of debris flow as a response to the design storm indicated (below). A high risk for debris flow is due largely to steep slopes, high soil burn severity, and unstable geology. Please refer to the project Geologic Hazards Report for information on post – fire risk of mass wasting and debris flow in the project area.

Retreat Fire, Okanogan-Wenatchee National Forest, Washington
Combined Hazard
Design storm: Peak 15-minute rainfall intensity 24 mm/h

USGS science for a changing world



Disclaimer - Limitations of Hazard Assessment

Hazard assessments use a design rainstorm with a given peak 15-minute rainfall intensity to predict the probability, volume, and combined relative hazard of debris flows in basins burned by the fire. Differences in model predictions and actual debris-flow occurrence will arise with differences in actual storm duration and intensity. The occurrence of higher rainfall intensities or longer storm durations may increase the probability or volume of potential debris flows.

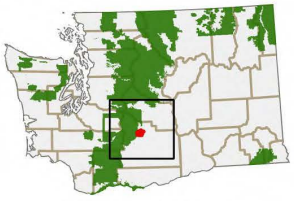
The models were developed, calibrated, and tested using data from the western United States. The models have not yet been tested in burn areas in the eastern United States, western Oregon, or Washington (west of the Cascade Range). Currently, efforts are being made to validate model predictions in the eastern United States, western Oregon, and Washington.

In addition, this hazard assessment relies upon readily available geospatial data, the accuracy and precision of which may influence the estimated likelihood and magnitude of post-fire debris flows. However, local conditions (such as debris supply) certainly influence both the probability and volume of debris flows. Unfortunately, locally specific data are not presently available at the spatial scale of the post-fire debris-flow hazard assessment. As such, local conditions that are not constrained by the model may serve to dramatically increase or decrease the probability and(or) volume of a debris flow at a basin outlet. The input geospatial data are also subject to error based upon mapping resolution, elevation interpolation techniques, and mapping and(or) classification methods. Finally, this assessment is specific to debris-flow hazards; hazards from flash-flooding are not described in this study and may be significant.

This assessment also characterizes potential debris-flow hazards at a static point in time immediately following wildfire. Studies of post-fire debris flow in the western United States have indicated that debris-flow activity in recently burned areas typically occurs within 2 yr of wildfire. As vegetation cover and soil properties return to pre-fire conditions, the threat of debris-flow activity decreases with time elapsed since wildfire. Conversely, the hazards from flash-flooding may persist for several years after the wildfire.

Finally, this work is preliminary and is subject to revision. It is being provided due to the need for timely "best science" information. The assessment is provided on the condition that neither the U.S. Geological Survey nor the United States Government may be held liable for any damages resulting from the authorized or unauthorized use of the assessment.

Okanogan-Wenatchee National Forest, WA



Projection: NAD1983, UTM Zone 10N

PART V - SUMMARY OF ANALYSIS

Introduction/Background

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

Critical Values identified during the BAER assessment that have potential to be at risk as defined in FSM 2523.1 include human life and safety of employees and public, FS property (roads, trails, administrative, recreation infrastructure), cultural resources, natural resources including Threatened and Endangered species habitat, native plant communities, soil and water resources. The BAER team evaluated the risk to these critical values in accordance with the Interim Directive No. 2520-2019 by using the BAER risk assessment. An abbreviated version of the Retreat Fire Critical Value table is included below for BAER critical values with high or very high-risk rating for all resources and for very high, high, and intermediate risk rating for human life and safety. A complete version of this table including all resources and risk determinations is available upon request.

Table 4: 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**

Life/ Property/ Resource	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
Life and Safety	Windy Point Campground	Hazard trees	Very Likely	Many fire killed trees in the campground	Major	Major injury or loss of life	Very High	Close campground until hazard trees are mitigated	S12. Administrative Closure-Existing gate. Close campground until hazard trees are mitigated
Life and Safety	Rafting Tieton River	Hazard Trees(sweepers)	Likely	Sweepers already in the river	Major	Major injury or loss of life	Very High	Closure, outreach, signage, pulling or cutting sweepers	S1b. Trail/Recreation Hazard Signs posted on type 2 barriers
Life and Safety	Dispersed Sites along hwy 12	Hazard trees	Possible	A few hazard trees at 2 sites	Major	Major injury or loss of life	High	Signs or barrier	S2- Physical Closure Devices- Type 3 barricade with sign at 2 sites along highway 12 with hazard trees
Life and Safety	Dispersed camping at Bear Lake	Hazard tree	Possible	Many fire killed trees at the site	Major	Major injury or loss of life	High	Closure with barrier, signage or cut hazard trees	S2. Physical Closure Devices- Gate
Life and Safety	14 road dispersed camping (Oak Cr Area Dispersed Camping 1400/1401 and spur roads)	Hazard tree	Possible	Many dispersed camping sites with hazard trees	Major	Major injury or loss of life	High	Signage or maintain current closure	S1b. Trail/Recreation Hazard Signs. Larger sign at entrance of Oak Creek
Life and Safety	1201 Road Disperse Camping	Hazard Trees	Possible	Dispersed sites in burn area	Major	Major injury or loss of life	High	Signage. Closure not possible	S1b. Trail/Recreation Hazard Signs
Life and Safety	People traveling on FS Roads within or directly adjacent to fire	Flooding, debris flows, rock fall, hazard trees	Possible	Large Potential of snags, felling of trees, rock/land movement or other unforeseen timing of hazards	Major	Human safety at risk from post fire hazards	High	Road Warning Signs at Fire Perimeter, Closure	S1a. Road Hazard Signs. Road Warning signs at perimeter, closure of roads to public until post winter runoff

Life/ Property/ Resource	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
Life and Safety	FSR 1302512 Irrigation Ditch Crossing	Traffic along road could fall into ditch with burnt bridge out	Possible	Burnt bridge over ditch along roadway may not be visible in dark conditions	Major	Human safety at risk from crossing fast moving water in ditch with bridge out	High	Close road, barricade crossing until YTID replaces bridge, install warning signs	S2. Physical Closure Devices- Gate
Life and Safety	1146 trail	Hazard Trees and debris	Unlikely	Mostly lower burner severity. Some hazard trees. Hikers and bikers moving along the trail	Major	Major injury or loss of life	Intermediate	Warning sign	S1b. Trail/Recreation Hazard Signs
Life and Safety	Cabin at Windy Point	Burned structural material	Possible	Highly visible from the highway. Adjacent to Windy Point Campground. Attractive nuisance	Moderate	Minor injury could result	Intermediate	Barrier at driveway, signage, fencing, site cleanup	S2. Physical Closure Devices. Type 3 barrier
Life and Safety	OHV Trails- 4W652, 4W672, 4W671	Hazard Trees	Unlikely	Some Mod, very little High SBS, mostly Low/Unburned off off-road vehicle use moving through area	Major	Major injury or loss of life	Intermediate	warning signs	S1a. Road Hazard Signs
Life and Safety	Trails- 224,232,237,262 and 1158 Bear Canon (Rd 1301)	Hazard Trees	Unlikely	Low, Mod, High SBS, users moving through area	Major	Major injury or loss of life	Intermediate	warning signs	S1b. Trail/Recreation Hazard Signs
Life and Safety	Trail- 4W325A	Hazard Trees	Unlikely	Low and Mod SBS, part of fireline and received suppression repair work	Major	Major injury or loss of life	Intermediate	warning signs	S2. Physical Closure Devices. Type 3 barrier
Natural Resources - Native Plants	Native Plant communities	Invasive plant colonization of areas disturbed by suppression. Weed wash not in place until 5 days into the incident.	Very Likely	Clearing fire lines, staging areas and safety areas exposed mineral soil creating ideal conditions for new populations to establish. Suppression and repair equipment and personnel likely also vectored seeds from known and	Major	Invasive populations can spread exponentially in newly disturbed area resulting in long-term effects to intact native plant communities. The optimal plan is to remove the first invading plants before a new population can establish.	Very High	Early Detection Rapid Response (EDRR)	P1b. Invasives EDRR - Suppression. EDRR is proposed on dozer lines, helispots, staging areas and shaded fuel breaks created with heavy equipment.

Life/ Property/ Resource	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
				unmapped populations to the newly disturbed areas.					
Natural Resources - Native Plants	Native Plant Communities	Invasive plant colonization of areas with 50-100% basal area loss that are now vulnerable because of burned soils and loss of canopy cover.	Very Likely	Approximately 308 acres of invasive plants have been previously mapped in the footprint of the fire. Many of these are species flourish post fire.	Moderate	Bare burned at moderate to high severity in native plant communities adjacent to invasive plant populations. These invasive plants often contain allelopathic compounds which change soil ph and growth forms that outcompete some of the native plant community in severely burned soil.	Very High	Early Detection Rapid Response (EDRR)	P1a. Early Detection Rapid Response. Treatment will be focused in areas where invasive plants have been previously mapped and basal area loss greater than 50%.
Property - Roads	FSR 1400 Oak Creek	Elevated runoff/flooding, debris flows and dry ravel, tree and rockfall from post fire conditions	Likely	Moderate-and high SBS burned hillslopes and drainages above the road in several locations	Major	Loss of ML 3 collector road that is access to Bear Lake and multiple trails and dispersed sites.	Very High	Close road, stormproof road, remove pipes, outslope road, construct dips at crossings w/ diversion potential, storm inspection and response	R1. Storm Proofing, R2a. New Drainage Feature-Drainage Dip, and R5. Critical Armored Dip-. Stormproof road, construct dips at crossings w/ diversion potential that are below or within high and moderate SBS

Life/ Property/ Resource	Critical Value	Threat to Value	Probability of Damage or Loss	Rationale for Probability	Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
Property - Roads	FSR 1400235 Bear Lake	Elevated runoff/flooding, debris flows and dry ravel, tree and rockfall from post fire conditions	Very Likely	Moderate-and high SBS burned hillslopes and drainages above the road	Major	Loss of ML 3 collector road that is access to Bear Lake and multiple trails and dispersed sites.	Very High	Close road, stormproof road, remove pipes, outslope road, construct dips at crossings w/ diversion potential, storm inspection and response	R1. Storm Proofing, R2a. New Drainage Feature - Drainage Dip, and R6. Culvert Modification/Drop Inlet. Stormproof road, construct dips and add culvert inlets at crossings w/ diversion potential that are below or within high and moderate SBS
Property - Roads	FSR 1401 South Fork Oak Creek	Elevated runoff/flooding, debris flows and dry ravel, tree and rockfall from post fire conditions	Very Likely	Moderate-and high SBS burned hillslopes and drainages above the road in several locations	Major	Loss of ML 3 collector road that is access to multiple trails and dispersed sites.	Very High	Close road, stormproof road, remove pipes, outslope road, construct dips at crossings w/ diversion potential, storm inspection and response	R1. Storm Proofing, R2a. New Drainage Feature- Drainage Dip, and R5. Critical Armored Dip-. Stormproof road, construct dips at crossings w/ diversion potential that are below or within high and moderate SBS
Property - Other	Windy Point Campground-Double CXT	Hazard trees	Very Likely	Hazard trees around the CXT	Moderate	Moderate damage to FS property	Very High	Fall hazard trees around CXT	S3. Hazard Tree Falling . Fall hazard trees around CXT
Cultural	Resource	6170800103	Likely	Likely due to visibility post-fire and proximity to well-traveled road	Moderate	Loss of cultural resource	High	Signs containing laws and regulations, slash placed to camouflage, camera	H1. Heritage and Cultural Resource Protection. Place game camera and place slash to camouflage

B. **Emergency Treatment Objectives:** The primary objective of this Burned Area Emergency Response Report is to recommend treatments to manage identified unacceptable risks from "imminent post-wildfire threats to human life and safety, property, and critical natural resources on National Forest System lands" (FSM 2523.02). These treatments are expected to substantially reduce the probability of damage to identified BAER critical values.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: NA
Channel: NA
Roads/Trails: 75
Protection/Safety: 90

D. Probability of Treatment Success:

Table 5: Probability of Treatment Success

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

E. Cost of No-Action (Including Loss): $694,446

F. Cost of Selected Alternative (Including Loss): $214,254

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader:
Email: Joe Blanchard **Phone(s):** 203-241-7340

Forest BAER Coordinator:
Email: Karenth Dworsky **Phone(s):** 907-223-2637

Team Members: *Table 6: BAER Team Members by Skill*

Skill	**Team Member Name**
Team Lead(s)	Joe Blanchard John Rihs
Soils	David Watson
Hydrology	Zack Mondry
Engineering	Ken Biglow
GIS	Dave Keenum
Archaeology	Corrine Michel Ann Wilkinson
Weeds	Sienna McDonald
Recreation	Angela McPhee
Other	Karenth Dworsky - BAER Coordinator Kate Michelson – Geologist, Washington State DNR Emile Richard – Geologist, Washington State DNR Eric Merten – Fish Biologist

H. Treatment Narrative:Land Treatments:

Invasive Weeds Treatments:

Preventing invasive plants from establishing in weed-free burned areas is the most effective and least costly management method. This can be accomplished Early Detection and Rapid Response (EDRR). This process involved surveying for noxious weeds early and treating them before vegetative spread or seed dispersal. Treatment methods can be done by manual techniques or using select herbicides through Okanogan Wenatchee Forest Wide Invasive Plant Management EIS (2017).

Two treatments for rehabilitation of burned and suppression areas are recommended:

P1a. Early Detection Rapid Response (EDRR) for areas with 50-100% basal area loss that intersect with existing invasive populations or special habitats. Treatment of invasive plants within the first year is critical to prevent establishment. EDRR would be used to survey, treat, and monitor invasive plants in moderate to high severity burn areas adjacent to existing invasive populations. There are approximately 145 acres of prescribed BAER EDRR treatment in the Retreat fire perimeter. This work should be at the discretion of the local botanists or invasive coordinator and their local knowledge of these invasive plant populations.

P1b. Early Detection Rapid Response (EDRR) in areas with suppression impacts. Approximately 115 acres of dozer line, landings, staging areas, drop sites, reopened closed roads and shaded fuel breaks created with heavy equipment that were utilized during suppression activities. These areas will be surveyed thoroughly, and plants treated within the year before potential seed set.

Fire lines, drop points, helispots, staging areas and shaded fuel breaks created with heavy equipment are the focus of EDRR treatment to mitigate the risk of introduction and spread of invasive weeds into native plant communities.

Line Item	Unit	Cost per unit	Total
P1a. Invasives EDRR			
Known invasive populations with > 50% basal area mortality	89 acres	$130	$11,570
Special Habitats	56 acres	$130	$7,280
Implementation monitoring	3 days	$300	$900
P1b. Invasives EDRR - Suppression Repair			
Ground disturbing areas	115 acres	$130	$14,950
Implementation monitoring	3 days	$300	$900
Total			$36,590

H1. Heritage Protection Treatment

Site 06170800103. The details of the value at risk and proposed treatment can be found in the heritage report and will not be included in this report due to the sensitive nature of the resource.

Project Cost H1	
Project Name:	6170800103

Project Estimates (add lines if needed):

Additional Unit Capacity Needs (e.g., detailers/seasonals/OT):			
Grade	**Cost/day**	**Days needed**	**$ 461.12**
4 Step 5 (OT)	$ 230.56	0.5	$ 115.28
4 Step 5 (OT)	$ 230.56	0.5	$ 115.28
4 Step 5 (OT)	230.56	0.5	$ 115.28
4 Step 5 (OT)	230.56	0.5	$ 115.28
Other Materials and Services (including contracting costs):			
Item	**Cost/unit**	**Units needed**	**$ 1,100.00**
Signage	**$500**	**2**	$ 1,000.00
Game Camera	**100**	**1**	$ 100.00
Total funding requested:			**$ 1,561.12**

Click here to enter text.

Channel Treatments: N/A

Roads and Trail Treatments:

R1 - Storm Proofing - Clean inlet/Catch Basin/Culverts/Ditches & Lead off ditches

- Objective: Provide an intercept path for sheet flows off fire-impacted slopes and associated debris without filling in and diverting flow into the traveled-way of the road.
- Description: Clean existing culverts, culvert inlets and catch basins, dig ditches, deeper than existing to increase capacity where particularly high runoff is expected to occur based on hydrological models. Remove earthen berms off outside edge of road where it could prevent water from exiting roadway and blade road to remove high spots to facilitate drainage over and off roadway. Cost assumes cleaning nine culverts per mile, reconditioning a ditch for a mile and removing 20 CY of berm material per mile. Cost also accounts for mobilization of equipment to do the work.

R2a - Construct Drainage Dip

- Objective: Provide relief flow path for flooded roadway or overwhelmed culvert crossings to minimize diversion potential, associated **erosion,** and subsequent damage of road prism.
- Description: Excavate a drivable dip in road surface that will safely pass flow from overwhelmed drainage

R5 - Construct Critical (Armored) Dip

- Objective: Provide relief flow path for flooded roadway or overwhelmed culvert crossings to minimize diversion potential, associated erosion**,** and subsequent damage of road prism. Critical dips are at major stream crossings that will likely see heavier flow and require armoring in the base of the dip (in addition to the fill slope protection) to protect road base until culvert capacity can be restored.

- Description: Excavate a drivable dip and armor with riprap bases and outlets to protect erodible road bases and fill slopes in road surface that will safely pass flow from overwhelmed drainage ta major stream crossings.

R6 - Culvert Modification - Install Drop Inlet

- Objective: Protect pipe drainage from debris and deposition.
- Description: Install vertical CMP riser at the inlet end of pipe. Cost accounts for mobilization of equipment and material to site, excavation and repair or cutting of inlet, installation of drop inlet and backfilling around drop inlet once installed.

USFS Treatment Schedule - Retreat BAER Road Assessment for Property

Treatment	Unit	Unit Cost	Quantity	Cost
R1 - Storm Proof	MILE	$8,415.00	5.02	$42,217.52
R2a - Drain Dip	EACH	$5,060.00	15	$75,900.00
R5 - Critical/ Armored Dip	EACH	$6,270.00	3	$18,810.00
R6 - Culvert Modification/ Drop Inlet	MILE	$2,420.00	2	$4,840.00
Retreat BAER Property Road Treatment Totals =				**$141,767.52**

Retreat BAER Proposed Road Treatment for Property Costs Breakdown									
Road	***ML***	***Unit Costs***	***$8,415.00***	***$5,060.00***	***$6,270.00***	***$2,420.00***	***$314,820.00***	***Cost to Treat Road***	

		Treated Miles	*R1 - Storm Proof (Miles)*	*R2a - Drain Dip (Each)*	*R5 - Critical/ Armored Dip (Each)*	*R6 - Culvert Modification/ Drop Inlet (Each)*	*Cost to Not Treat Road**		*Cost to Treat per Mile*
EMERGENCY REPONSE ROAD TREATMENTS FOR PHYSICAL PROPERTY									
FSR 1400 - Oak Creek	3	14.38	1.90	6	1	0	$4,528,370.88	$52,615.14	$3,657.89
FSR 1400235 - Bear Lake	3	1.70	1.28	5	0	2	$535,194.00	$40,879.93	$24,047.02
FSR 1401 - South Fork Oak Creek	3	6.71	1.84	4	2	0	$2,112,442.20	$48,272.45	$7,194.11
Subtotal BAER Road Property Treatments		**22.79**	**5.02**	**15**	**3**	**2**			
Total Cost BAER Road Property Treatments			**$42,217.52**	**$75,900.00**	**$18,810.00**	**$4,840.00**	**$7,176,007.08**	**$141,767.52**	**$6,219.51**

Protection/Safety Treatments:

S1a - Install Road Hazard/Warning Signs

- Objective: Notify public of potential road hazards and unsafe conditions.
- Description: Install signs at Forest entry points and replace fire damaged warning signs. Cost includes ordering all material (sign panels, posts, wind bracing and connection hardware) plus contractor time, mobilization of equipment to the site and equipment time to install as forest road crew staff lacks capacity to install. Signs expected to be larger signs requiring two posts per sign and wind bracing steel channels on the back of the sign.

S2 - Physical Closure Device – 'Powder River' Style Gate

- Objective: Provide a more effective hard closure to the highest risk area while maintaining access for canal by Yakima-Tieton Irrigation District.
- Description: Install 'Powder River' Style gate at road entry point or at a turnaround along the road prior to the canal crossing with locking posts in concrete (footings or anchored into ecology blocks). Cost includes all material, freight plus time to install and mobilization to the site.

USFS Treatment Schedule - Retreat BAER Road Assessment for Safety

Treatment	Unit	Unit Cost	Quantity	Cost

S1a - Road Warning Sign	EACH	$1,100.00	11	$12,100.00
S2 - Physical Closure Device	EACH	$5,000.00	2	$10,000.00
Retreat BAER Road Safety Treatment Totals =				**$22,100.00**

Retreat BAER Proposed Road Treatment for Safety Costs Breakdown			
Unit Costs	***$1,100.00***	***$5,000.00***	
Road	***S1a - Road Warning Sign (Each)***	***S2 - Physical Closure Device (Each)***	***Cost Totals***
EMERGENCY REPONSE ROAD TREATMENTS FOR LIFE & SAFETY			
FSR 1302512 Canal Crossing	0	1	$5,000.00
Warning Signs at Fire Perimeter	11	0	$12,100.00
Bear Lake CG on FSR 1400235*	0	1	$5,000.00
Subtotal BAER Road Life & Safety Treatments	**11**	**1**	
Total Cost BAER Road Life & Safety Treatments	**$12,100.00**	**$5,000.00**	**$22,100.00**
**Gate at Bear Lake Campground is for recreation and is included for simplicity in funding request and implementation. See recreation report for more details*			

Recreation site Treatments:

Protection/Safety Treatments:

S1b. Warning/Closure signs

To maintain closure of Windy Point campground, dispersed camping areas, warn users of fire effect hazards on trails and dispersed camping. And to warn users of rafting hazards on Tieton River by posting warning signs at river access points.

- 19 Warning/closure signs (campground/dispersed camping/trails)
  $150 each = $2,850
- 25 Warning signs for rafting at river access points using Type 2 barrier signs.
  $250 each = $6,250

S2. Closure Barrier

To maintain closure of dispersed camping areas that contain burned hazard trees. Two sites along Highway 12 that contain burned hazard trees. As well as entry access into fire perimeter of Oak Creek area via the 4W325A trail. Using Type 3 road barriers.

- $600/each – 4 barriers = $2,400

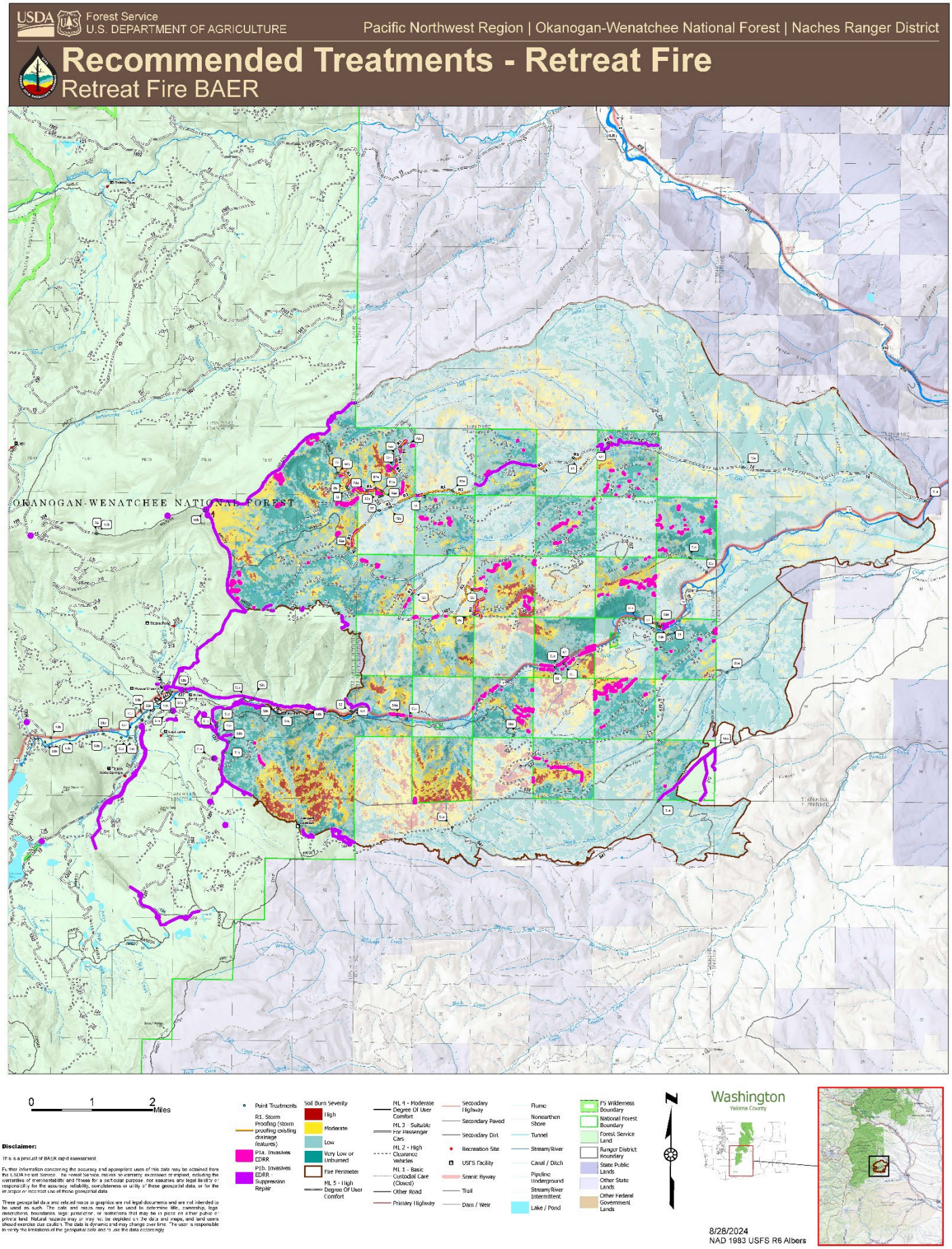
S7. Infrastructure Protection:

- Hazard Tree Felling at Windy Point Campground - $900

Total = $12,400

I. Monitoring Narrative:

None


USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE
Pacific Northwest Region | Okanogan-Wenatchee National Forest | Naches Ranger District
Recommended Treatments - Retreat Fire
Retreat Fire BAER
OKANOGAN-WENATCHEE NATIONAL FOREST
0 1 2 Miles
Disclaimer:
This is a product of BAER rapid assessment.
Further information concerning the accuracy and appropriate uses of this data may be obtained from the USDA Forest Service. The Forest Service makes no warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, nor assumes any legal liability or responsibility for the accuracy, reliability, completeness or utility of these geospatial data, or for the improper or incorrect use of these geospatial data.
These geospatial data and related maps or graphics are not legal documents and are not intended to be used as such. The data and maps may not be used to determine title, ownership, legal descriptions, boundaries, legal jurisdiction, or restrictions that may be in place on either public or private land. Natural hazards may or may not be depicted on the data and maps, and land users should exercise due caution. The data is dynamic and may change over time. The user is responsible to verify the limitations of the geospatial data and to use the data accordingly.
Point Treatments
R1. Storm Proofing (storm proofing existing drainage features)
P1a. Invasives EDRR
P1b. Invasives EDRR - Suppression Repair
Soil Burn Severity
High
Moderate
Low
Very Low or Unburned
Fire Perimeter
ML 5 - High Degree Of User Comfort
ML 4 - Moderate Degree Of User Comfort
ML 3 - Suitable For Passenger Cars
ML 2 - High Clearance Vehicles
ML 1 - Basic Custodial Care (Closed)
Other Road
Primary Highway
Secondary Highway
Secondary Paved
Secondary Dirt
Recreation Site
USFS Facility
Scenic Byway
Trail
Dam / Weir
Flume
Nonearthen Shore
Tunnel
Stream/River
Canal / Ditch
Pipeline Underground
Stream/River Intermittent
Lake / Pond
FS Wilderness Boundary
National Forest Boundary
Forest Service Land
Ranger District Boundary
State Public Lands
Other State Lands
Other Federal Government Lands
N
Washington
Yakima County
8/28/2024
NAD 1983 USFS R6 Albers

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											
P1a. Invasives EDRR	Acres	136	145	$19,749	$0			$0		$0	$19,749
P1b. Invassives EDRR - Sup	Acres	138	115	$15,870	$0			$0		$0	$15,870
H1. Heritage Protection	EACH	1,561	1	$1,561	$0			$0			$1,561
Subtotal Land Treatments				$37,180	$0			$0		$0	$37,180
B. Channel Treatments											
				$0	$0			$0		$0	$0
Subtotal Channel Treatments				$0	$0			$0		$0	$0
C. Road and Trails											
R1 - Storm Proofing	MILE	8,415	5	$42,243	$0			$0		$0	$42,243
R2a - Drain Dip	EACH	5,060	15	$75,900	$0						$75,900
R5 - Critical Dip	EACH	6,270	3	$18,810	$0						$18,810
R6 - Cluvert modification	EACH	2,420	2	$4,840	$0			$0		$0	$4,840
Subtotal Road and Trails				$141,793	$0			$0		$0	$141,793
D. Protection/Safety											
S1a - Road Warnign Sign	EACH	1,100	11	$12,100	$0			$0		$0	$12,100
S2 - Physical Closure Devic	EACH	5,000	2	$10,000							$10,000
S2 - Physical Closure Devic	EACH	600	4	$2,400							$2,400
S1b - Rec. Warning Sign	EACH	250	25	$6,250							$6,250
S1b - Rec. Warning Sign	EACH	150	19	$2,850							$2,850
S7 - Infrastructure Protectio	DAYS	850	2	$1,700	$0			$0		$0	$1,700
Subtotal Protection/Safety				$35,300	$0			$0		$0	$35,300
E. BAER Evaluation											
Initial Assessment	Report	$53,305	1	$53,305	$0			$0		$0	$0
				$0	$0			$0		$0	$0
Subtotal Evaluation				$53,305	$0			$0		$0	$0
F. Monitoring											
				$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				$267,578	$0			**$0**		**$0**	**$214,273**
Previously approved											
Total for this request				**$267,578**							

PART VII - APPROVALS

TARA UMPHRIES Digitally signed by TARA UMPHRIES
Date: 2024.08.30 12:57:28 -07'00'

1. _____
Forest Supervisor Date