Date of Report: October 8, 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: TwentyFive Mile

B. Fire Number: WA-OWF-000521

C. State: Washington

D. County: Chelan

E. Region: Pacific Northwest (R6)

F. Forest: Okanogan-Wenatchee

G. District: Chelan

H. Fire Incident Job Code: P6N8JK21 (0617)

I. Date Fire Started: August 15, 2021

J. Date Fire Contained: 62% as of 10/05/2021 Estimated 100% on 10/30/2021

K. Suppression Cost: Estimated Final $35 million, as of 9/23/2021 $29.2 million

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

1. **Fireline repaired (miles): 22 (15 dozer, 7 hand)**
2. **Other (identify): None as of 9/30/2021**

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170200090301	Twentyfive Mile Creek	26936	21268	79
170200090302	Mitchell Creek-Lake Chelan	35081	520	1
170200090210	Falls Creek-Lake Chelan	22388	238	1
Six others		116298	140	0

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	20682
OTHER FEDERAL (LIST AGENCY AND ACRES)	0
STATE	730
PRIVATE	653
TOTAL	22065

O. Vegetation Types: Shrub steppe, Riparian, Dry Ponderosa pine/Douglas Fir forest, aspen, montane mixed conifer forest, subalpine fir and whitebark pine forest

P. Dominant Soils: Soils are generally steep, weakly developed, deep, and well drained, derived from volcanic ash and/or pumice over colluvium and residuum from granodiorite or rhyolite. Soils include: Typic Vitrixerands (5,893 ac.), Andic Haploxerepts (3,541 ac.), Xeric Vitricryands (2,010 ac.), and Xeric Vitricryands (1286, ac.)

~~Q.~~ Geologic Types: The geology of the area within the fire perimeter consists of a mixture bedrock that was sculpted by glaciers multiple times. Primarily ~~the~~ rocks are ~~various~~ metamorphic ~~rocks~~ including orthogneiss and migmatite. Along the southern margin of the fire intrusive granite is exposed. In the valleys a veneer of glacial drift (till) sits on top of the bedrock, forming benches along the valley walls. There is abundant volcanic pumice and ash in the area on top of both bedrock and glacial 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	10.8
INTERMITTENT	41.4
EPHEMERAL	
OTHER (DEFINE)	

S. **Transportation System:**
Trails: *National Forest (miles):* 18.2 *Other (miles):*
Roads: *National Forest (miles):* 54.9 *Other (miles):* 0.3 (Chelan 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	1195	0	1	36	1232	**6**
Low	7746	0	480	398	8604	**39**
Moderate	6651	0	268	189	7108	**32**
High	4540	0	4	30	4570	**21**
Rock	552	0	0	0	**552**	**3**
Total	20684	0	729	653	**22066**	**100**

B. Water-Repellent Soil (acres): 11,678 (all high and moderate burn severity acres)

C. Soil Erosion Hazard Rating: Slight 335 acres (1.5%), Moderate 13,228 (60%), High 8,425 38%), N/A 74 (0.5%)

D. Erosion Potential: 9 – 19 tons/acre (11 average)

E. Sediment Potential: 720 – 1540 cubic yards/square mile (880 average)

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

G. Estimated Hydrologic Response (brief description): Effective ground cover and canopy (shrubs and trees) have been reduced or eliminated within areas of moderate or high burn severity. A very high percentage (79%) of the Twenty-Five-mile watershed is burned with 53% of the burned area exhibiting water repellent conditions. Without canopy cover splash erosion will increase dramatically and with water repellent conditions and limited areas of effective ground cover erosion and runoff will increase dramatically. Initial intensive rainfall events will transport ash and initiate runoff events that will mobilize and transport bedload and debris disproportional to the amount of flow. Tributaries to Twenty-Five Mile Creek which would not have any projected flows from a 5 yr one hour rainfall event could produce flows that will measure in the 100s of cubic feet per second (cfs). As ground cover and canopy cover increases with water repellency decreasing over time, runoff response and soil detachment and sediment transport will decrease. In areas that have reburned and are now classified as high burn severity, this process may take years.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

The Twenty-Five Mile Fire was first reported on August 15, 2021 with the possible cause still under investigation. It is currently reported at 22,217 acres almost all of which is within the 26,997 acres Twenty-Five Mile Creek Watersbhed which drains into Lake Chelan. The area within the fire perimeter is over 82% of watershed area and the combined area of high and moderate burn serverity makes up just over 43% of the entire watershed area (53% of the fire perimeter). BAER prework was informally initiated on September 13 with an assessmnt team in place on September 16. The assessment process reviewed and evaluated values at risk within and downstream of the burned area resulting in “BAER Critical Values” selected for treatment recommendations on National Forest System lands.

A. 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):

Multiple threats related to human life and safety include

Access to communication sites; on Slide Ridge, a Forest Service Repeater needed for up and down lake communications, fire, emergency trafiic, district management. On Grouse Mountian, Chelan County’s RiverCom tower which is the primary emergency network for the County (likely, high)

Flooding to include the potential for breach hydrolog and debris flows that could overtake or trap users within the burned area (likely, very high)

Use of roads, trails, campgrounds and dispersed recreational sites where falling burned hazard trees, rolling rocks and debris could injure users or strand users from getting out or help getting in. (likely, high)

Users of Lake Chelan State Park (off forest). High runoff events and debris laden flows may impacts users and facilities (fuel storage) at this state park below the burned area

2. Property (P):

Threat to the Property (roads):(Very High)
Post fire impacts to roads and related infrastructure may occur in response to increased flows, sediment transport and debris that may cause failure of existing drainage features and erode road prisms near creeks and at major drainage crossings of impacted watersheds. Benched roads with significant burned areas above are also susceptible to mass wasting and debris flows in addition to the risks previously mentioned. (High/High)

Threat to Property (trails); (Very High)
Like roads, impacts to and loss of trail prisms may occur in response to increased flows, sediment transport and debris that may cause failure of existing drainage features and erode prisms within or immediately downgradient moderate and high burn severity and at drainage crossings of impacted watersheds. Benched trails with significant burned areas above may also be susceptible to mass wasting and debris flows in addition to the risks previously mentioned. (Very High/High)

3. Natural Resources (NR):Threats to Vegetation Recovery (Very High)
Increase in Invasive Plant Populations: (Very Likely, Moderate)
Deterioration of habitat and direct competition from invasive plants spreading along suppression lines into previously un-infested areas.

Spread of invasive plants into un-infested areas due to conditions created by the fire (removal of competing vegetation cover, loss of shade, early seral conditions).

Threats to Water Quality (Very High). Ash and sediment laden high flows can potentially effect water quality in Lake Chelan and impact water users diverting water from TwentyFive Mile Creek.

Threats to Soil Productivity (High) Postfire erosion rates exceed tolerance. Further evaluation of conditions and potential feasibility of treatments are being explored for inclusion in a future interim request.

Threats to Hydrologic Function (High) Postfire runoff rates range for a few times greater than prefire to orders of magnitude higher for the smaller tributaries. Further evaluation of conditions and potential feasible of treatments to reduce post fire runoff are being explored for inclusion in a future interim request.

4. Cultural and Heritage Resources:
An assessment of post-fire threats to cultural and heritage resources has not been initiated for this initial BAER request. An assessment and BAER risk assessment will be completed on culturaland heritage resources as soon as is practicable and capacity becomes available.

B. Emergency Treatment Objectives:

a. Reduce the post-fire risks to life and safety by installing signage, an additional gate, and temporary closures.
b. Storm-proof and stabilize roads where feasible and practicable to protect property investments and maintain access for administrative and emergency use. Patrol roads, safely, during and immediately after rain events to clear debris from drainage structures and reestablish drainage as needed.
c. Maintain native plant communities and soil stabilization through early detection/rapid response (EDRR) and subsequent treatments to minimize the spread of noxious weeds and specific invasives.
d. Provide support for an ALERT station installation to provide early flood warnings through NWS and Chelan County

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land: 90
Channel: N/A
Roads/Trails: 70
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	90	80	70
Channel	N/A	N/A	N/A
Roads/Trails	80	80	75
Protection/Safety			

E. Cost of No-Action (Including Loss): $1,053,000

F. Cost of Selected Alternative (Including Loss): $336,000

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Gregory A. Kuyumjian
Email: gregory.kuyumjian@usda.gov **Phone(s)** 509.293.3066

Forest BAER Coordinator: Molly Hanson
Email: molly.hanson@usda.gov **Phone(s):** 509.306.5418

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

Skill	**Team Member Name**
Team Lead(s)	Gregory A. Kuyumjian (AD)
Soils	Kristen Meier, Tracy Christopherson(t)
Hydrology	Robert Bamberger(t), Robin Fox (NWS)
Engineering	Ken Bigelow, Lori McAlister (AD)
GIS	Robert Arlowe, Kevin Carns
Archaeology	
Weeds	Brigitte Ranne

Skill	Team Member Name
Recreation	
Geology	Trevor Contreras(WA DNR), Kate Mickelson (WA DNR)
Other (PIO)	Jess Clark, Kevin Carns

H. Treatment Narrative:

Land Treatments:

P1b. Suppression Repair Invasive Plant Early Detection and Rapid Response (EDRR)

Early detection and treatment of invasive plants is critical to prevent them from becoming established. Treatment is most effective when infestations are small and before they can produce seed. EDRR is covered under the Okanogan-Wenatchee Forest-wide Site-specific Invasive Plant Management FEIS and ROD (2017) with a range of treatment options including use of 9 herbicides. Two EDRR survey and treatments on suppression lines will be needed in the 2022 growing season.

Dozer line – 15 miles, 72.7 acres, 15 days
Handline – 7 miles, 8.5 acres, 3 days
Drop Points/Parking areas/Spike Camps – 5 acres, 2 days
Suppression EDRR total 86 acres, 20 days x two visits = 40 days
40 days of a 2-person (GS6) field crew at $332 day = $13,280,
Herbicide and PPE - $500
Total - $13,780

P1a. Burned Area Invasive Plant Early Detection and Rapid Response (EDRR)

Early detection and treatment of invasive plants is critical to prevent them from becoming established. Treatment is most effective when infestations are small and before they can produce seed.

Two EDRR surveys and treatment of areas in and adjacent to known infestations (spotted and diffuse knapweed, bull thistle, Dalmatian toadflax, St. John's wort, and tree of heaven) will be needed in the 2022 growing season.

There are 36.9 miles of known infested roadsides in the burned area, and 75.4 acres of known infestations that are not strictly along roads. It is estimated that the first 40 feet on each side of the roads are most likely to be invaded by invasive plants resulting in 179 acres of roadsides in need of EDRR. The EDRR needs for the off-road infestations total 51 acres (see below). The roadsides can be spot treated with a truck mounted spray tank (fitted with long hoses). The off road infestations will use a combination of backpack sprayers and truck mounted sprayer with long hoses (estimated days are based on local experience with treating those infestations). Tree of heaven sprouts will be backpack sprayed, any surviving trees will cut and herbicide will be applied to the stumps.

Road infestations– 36.9miles/179 acres, 17 days
Tree of heaven – 10 acres, 3 days
Lone Peak knapweed – 11.5 acres – 2 days
Slide Ridge bull thistle – 4.1 acre – 1 day
Fire Camp and Helibase – 25.4 acres – 2 day

BAER EDRR total– 230 acres, 25 days x two visits = 50 days
50 days of a 2-person field crew (GS 6) at $332/day = $16,600
2 days trails sawyer (GS7) to cut any live tree of heaven for cut stump treatment - $364
Herbicide and supplies - $1000.00
Total - $17,964

Danger Tree Falling: This treatment will cover the removal of fire-killed trees at risk of falling and threatening the safety of crews implementing EDRR surveys and treatments. Survey and treat, as needed 26 acres identified as “off-road” areas. Estimated at 2 acres/day at $100/day for a total of $1300)

Total for BAER EDRR $19,264

Channel Treatments: N/A

Roads and Trail Treatments: Trail storm-proofing involves cleaning or armoring existing drainage structures to remove accumulated sediment and add drainage structures to provide capacity for elevated post-fire runoff. 6.2 miles within high or moderate burned severity.

T1. Trail drainage stabilization. Treatment includes trial stabilization and drainage improvements to include armoring and/or cleaning existing water control and adding additional drainage features to provide additional capacity for elevated sediment laden post-fire runoff. A total of 8 miles with 6.2 miles within moderate and high burn severity polygons with 1.8 miles either crossing existing drainages or immediately adjacent or downstream of areas with high runoff. Eight miles estimated at $4100/mile ($32,800)

Danger Tree Falling: This treatment will cover the removal of fire-killed trees (“danger trees”) at risk of falling and threatening the safety of crews implementing trail drainage implementation and protection within the 6.2 miles located within in moderate of high burn severity polygons. . Survey and treat, as needed up to 50 acres (~8 acres/mile) identified as a threat to crews working on trail drainage and stabilixzaton. Estimated at 2 acres/day at $100/day for a total of $2,500)

Total cost of trail drainage stabilization $35,30**R13. Inlet Cleanout**. Clean inlet/Catch Basin/Culvert Outlet. Dig ditch, waterbars and dips deeper than existing to increase capacity where particularly high severity burns are contributing to storm flows. 3 miles at $300/mile ($900)

R13. Repair “hole in road” from burned buried fill. Repair fire damage in travel-way of the road to provide for safe travel and reduce likelihood of road failure due to concentration of runoff.: Excavate all woody debris, fill and compact with appropriate material. 4 at $1000 each. ($4000)

R2a. Construct Dips Provide relief flow path for flooded roadway or overwhelmed culvert crossings to minimize diversion potential, associated erosion and subsequent damage of road prism. Excavate a drivable dip in road surface that will safely pass flow from overwhelmed drainage. 8 at $3100 Each ($24,800)

R2A. Construct Armored Dips Provide relief flow path for flooded roadway or overwhelmed culvert crossings to minimize diversion potential, associated erosion and subsequent damage of road prism. Excavate a drivable dip with an armored base and outlet in road prism that will safely pass flow from overwhelmed drainage. 2 at $4300 Each ($8,600)

R13. Remove Berm. Allow flows to pass through road to avoid damage to road prism. Remove berm to allow free drainage 0.6 miles at $350/mile ($210)

R3. Remove Culvert. Allow flows to pass through natural drainage. Remove culverts from 15 miles of roads and legally dispose of culverts off Federal Lands $2,700/mile. 15 Miles at $2,700/mile. ($40,500)

R2. Storm Inspection and response. Monitor road drainage features, armoring and other treatments as they respond to significant storm events and subsequently repair damages that compromise the effectiveness of these treatments. .Inspection by qualified persons, determination of effectiveness, coordination of treatment restoration. 16 miles at $3,000/mile ($48,000)

R2. Storm Inspection and response with heavy equipment. Monitor road drainage features, armoring and other treatments as they respond to significant storm events and subsequently repair damages that compromise the effectiveness of these efforts. Response requires heavy equipment with multiple personnel to ensure existing drainage and road remain in functional status. Inspection by qualified persons, determination of effectiveness, coordination of treatment restoration. Anticipating 2 events at $5760/event. ($11,520)

R15. BAER Implementation Coordination: A BAER implementation coordinator assigned to the TwentyFive Mile Fire to coordinate and ensure the treatments are completed within the one-year time constraint and coordinate with local personnel. 15 days at $400/day. ($6,000). This position may be filled locally with an AD-K or cover the cost of travel, lodging, per diem and limited overtime as needed to cover an on-site detailer.

Protection/Safety Treatments:

S3. Danger Tree Falling: This treatment will cover the removal of fire-killed trees (“danger trees”) at risk of falling and threatening the safety of crews implementing trail drainage implementation and protection within the 6.2 miles located within in moderate of high burn severity polygons. . Survey and treat, as needed up to 50 acres (~8 acres/mile) identified as a threat to crews working on trail drainage and stabilizaton. (Showing as S3. acres for trails Estimated at 2 acres/day at $500/day for a total of $12,500)

S2. Closure Gate located on the 8410 road near the soth perimeter of the fire for emergecny use to close off access in the event of a large bebris flow or results of major post fire flooding resulting in unsafe conditon downstream from Slide Ridge. $8000.

S1a&b. Road and trail warning signs at key locations and trailheads. Six road signs and 13 and trail and recreation sites. Nineten signs at $700 each.

S12. Process and issue, if needed, an emergency Special Use Permit to Chelan County to install and maintain an ALERT Station riangage to provide data for early warnings issued by NWS and Chelan County Emergency Services, Station will be located at or near the headwaters of high severity catchments tributary to the North Fork TwentyFive Mile Creek. $2000.

S6. Pot Peak Trailhead CXT (concrete vault toilet) . Pump, sanitize, wrap and sandbag to reduce possibility of high flow contamination and discharge into TwentyFive Mile Creek. ($1000)

I. Monitoring Narrative: N/A

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Line Items	Units	Unit Cost	# of Units	BAER $	Other $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
P1b. EDRR Suppresion	acres	87	158.7	$13,780	$0		$0		$0	$13,780
P1a. EDRR Burned Areas	acres	84	230	$19,266	$0		$0		$0	$19,266
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$33,046	$0		$0		$0	$33,046
B. Channel Treatments										
N/A				$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										
R13. Inlet clean outs	mile	300	3	$900	$0		$0		$0	$900
R2a. Construct Dips	each	3,100	8	$24,800	$0		$0		$0	$24,800
R2a. Construct armored dips	each	4,300	2	$8,600	$0		$0		$0	$8,600
R13. Remove Berm	each	210	1	$210	$0		$0		$0	$210
R3. Remove culverts	mile	2,700	15	$40,500	$0		$0		$0	$40,500
R2. Storm Inspection	miles	3,000	16	$48,000	$0		$0		$0	$48,000
T1. Trail Drainage Stabilizati	mile	4,413	8	$35,300	$0		$0		$0	$35,300
R2. Storm response (equipment)	each	5,760	2	$11,520	$0		$0		$0	$11,520
R15 Implementation coordin	days	400	15	$6,000	$0		$0		$0	$6,000
R13, Other road treatment (t	each	1,000	4	$4,000			$0		$0	
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$179,830	$0		$0		$0	$175,830
D. Protection/Safety										
S2. Gate for emergecny clos	Each	8,000	1	$8,000	$0		$0		$0	$8,000
S1a & b. Warning Signs	Each	700	19	$13,300	$0		$0		$0	$13,300
S12. Alert station permit.	each	2,000	1	$2,000						$2,000
S6. Pot Peal Vault clean-out	each	1,000	1	$1,000						$1,000
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$24,300	$0		$0		$0	$24,300
E. BAER Evaluation										
Initial Assessment	Report			---	$71,000		$0		$0	$71,000
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$0	$71,000		$0		$0	$71,000
F. Monitoring										
				$0	$0		$0		$0	$0

PART VII - APPROVALS

1. KRISTIN BAIL Digitally signed by KRISTIN BAIL Date: 2021.10.08 13:59:10 -07'00'

Forest Supervisor Date