Date of Report: 8/5/21

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: Lick Creek

B. Fire Number: OR-UMF-00658

C. State: WA

D. County: Asotin and Garfield

E. Region: 6

F. Forest: Umatilla

G. District: Pomeroy

H. Fire Incident Job Code: P6N45S21 (0614)

I. Date Fire Started: 7/7/21

J. Date Fire Contained: 90% Contained as of 7/31/21

K. Suppression Cost: $15,623,413 as of 7/31/21

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

1. **Fireline repaired (miles): 42.9 miles of dozerline to be repaired**
2. **Other (identify):**

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170601030204	Charley Creek	14,386.56	14,130.91	98.2
170601060310	First Creek	13,576.04	24.48	0.2
170601070501	Headwaters Pataha Creek	18,320.12	115.44	0.6
170601070601	Headwaters Tucannon River	24,508.49	96.35	0.4
170601030205	Kearney Gulch-Asotin Creek	30,141.20	5,911.69	19.6
170601030202	Lick Creek	12,342.09	12,342.09	100.0
170601060704	Menatchee Creek	21,079.10	46.89	0.2
170601030201	North Fork Asotin Creek	28,163.08	27,970.91	99.3
170601070104	Page Creek	13,767.69	15.70	0.1
170601030203	South Fork Asotin Creek	25,820.99	19,802.84	76.7
170601030206	Upper George Creek	21,674.76	143.04	0.7

GRAND TOTAL	223,780.12	80,600.34	36%

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	54,411.72
BLM	82.88
STATE	19,441.25
PRIVATE	6661.16
TOTAL	80,597.01

O. Vegetation Types: The eastern portion of Lick Creek Fire consists of dry open grassland meadows dominated by bluebunch wheatgrass (*Pseudoroegneria spicata*), and Idaho fescue (*Festuca idahoensis*). The northern grassland slopes are moister with deep wind-swept soils and in addition to the grasses above they are dominated by snowberry (*Symphoricarpos albus*) and Wood's and Nootka rose (*Rosa woodsii* and *Rosa nuktana*). Ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*) are isolated to drainages and riparian areas. The western portion of the burned area is higher elevation (4000-6200ft) and is mainly dry Douglas fir forest which includes the species above and to a lesser extent grand fir (*Abeis grandis*).

P. **Dominant Soils:**
A mosaic of soil depths, rock content, and volcanic ash content are located within the burn area. The following soil classifications dominate the landscape area and are listed in order of estimated acres present.

Ashy over loamy-skeletal, amorphic over isotic, frigid Alfic Udivitrands
Loamy-skeletal, mixed, superactive, frigid Lithic Haploxerolls
Loamy-skeletal, isotic, frigid Vitrandic Argixerolls
Ashy over loamy skeletal, amorphic over isotic Typic Vitricryands
Loamy-skeletal, mixed, superactive, mesic Lithic Argixerolls
Fine-loamy, isotic, frigid Vitrandic Argixerolls
Ashy-skeletal over loamy-skeletal, amorphic over isotic, frigid Typic Udivitrands

Q. Geologic Types:
Relatively flat lying, repeating thick basalt and andesite flows (10 to 30 feet thick) interbedded with thin aeolian or alluvial deposits (1 to 5 feet thick) dominate the project area. Thin colluvial deposits mantle backslopes that transition to alluvial and fluvial deposits in drainages. Eroded deposits of fine, silt-size volcanic ash mantles the landscape ranging from over a meter to a few centimeters thick.

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	139.37
INTERMITTENT	249.69
EPHEMERAL	3.87
OTHER (DEFINE)	.07

S. **Transportation System:**
Trails: *National Forest (miles):* 25 *Other (miles):* 4
Roads: *National Forest (miles):* 118 *Other (miles):* 50

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	BLM	State	Private	Total	% within the Fire Perimeter
Unburned	10,327.82	2.70	1,097.09	999.96	12,427.57	15.4
Low	27,694.80	80.09	14,676.07	5,154.68	47,605.63	59.1
Moderate	13,126.55	0.10	3,512.40	506.51	17,145.56	21.3
High	3,262.55	0.00	155.70	0.01	3,418.26	4.2
Total	54,411.72	82.88	19,441.25	6,661.16	80,597.01	

B. Water-Repellent Soil (acres):

Severity	Acres	Estimated Water Repellent Acres
High	3,418	2,000
Moderate	17,146	7,700
Low	47,608	2,380
Unburned	12,427	0
Total	80,600	12,080

An estimated 15 percent of the burn area has water repellent soils (hydrophobic) ranging from slight to strong repellent. Hydrophobic soil has increased in small isolated areas under trees that were consumed by fire in the immediate vicintity of soil color changes to red or orange. Most hydrophobic changes in the burn area are small scale and disconnected from other hydrophobic areas. The fire induced loose, single-grain structure of silt loam soil will shed water until either wetted, weak structure forms or a crust forms.

C. Soil Erosion Hazard Rating:

High SBS – moderate to high
Moderate SBS – low to moderate
Low SBS – no to low
Unburned – no to low

D. Erosion Potential:

High SBS areas have a moderate to moderate-high potential for erosion to occur, with increasing potential to high in steep slope areas lacking down logs and rock cover on the soil surface. Moderate SBS areas have a low to moderate-low potential for erosion with increasing potential in areas that are steeply sloping and connected to high SBS or the stream system. Low SBS areas have no/low to low-moderate potential for erosion, increasing potential in areas that are steeply sloping and adjacent to or in the drainage.

E. Sediment Potential:

Sediment potential is likely.

F. Estimated Vegetative Recovery Period (years): Grassland habitats should recover in 1-3 years depending on SBS. Shrubland habitat should recover in 2-5 years depending on SBS as well as forested habitat with low severity. Forested habitat that endured moderate or high burn severity will take more than 5 years to recover.

G. Estimated Hydrologic Response (brief description): A peak flow analysis was conducted for a 10-yr, 24-hour storm with 2” of precipitation. Small headwater basins (< 500 acres) with moderate to high SBS are expected to see peak flow increases up to 4 times the pre-fire condition and may result in debris flows that can have local effects on water quality and fish habitat. Larger basins include a mosaic of unburned to high SBS and the runoff response is expected to be up to lower due to the higher amounts of low and unburned landscape, although the initial erosion pulse will contain ash and fine soil particles that will cause a temporary

increase in turbidity. These processes will attenuate over time and should recover to pre-fire rates over the next 3-5 years, until effective ground-cover becomes re-established. The greatest impacts are most likely to occur in the first year or two after the fire.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

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):** Human life/safety is at risk on NFS land from threats associated with post-fire related hazard trees, rock fall, increased flooding and debris flows, and loss of egress/access throughout the burned area, but particularly on roads and trails. A fair number of Forest Service roads and trail heads are accessed from Washington State DNR lands. Interagency coordination with this land manager will be critical in promoting human life and safety. A large number of the primary two digit roads have already been snagged out thus greatly reducing the overhead hazards however the other four and seven digits road have not been inspected for over head hazards. Treatments sure as closure and signage will be critical in protecting human life and safety.

2. **Property (P):**Damage to or loss of sections of road and trail could occur from increased runoff, erosion, flooding, and potentially debris flows within and downslope or downstream of areas of moderate and high soil burn severity. There are approximately 9.7 miles of trail are at risk of trail loss due to high and moderate burn severities upslope. Pre-fire, these are high use trails.

3. **Natural Resources (NR):**
   a. **Hydrologic Function,** fire impacts proper functioning of hydrologic processes with the greatest and longest lasting impacts occurring from high soil burn severity and anthropogenic activities. Fire impacts within moderate, low, and very low burn areas are recoverable and expected to diminish as vegetation reestablishes. Most of the burn area resulted in low soil burn severity.

      The runoff response for the fire area was evaluated using a probable storm precipitation total and the Wildcat5 rainfall-runoff model. Wildcat5 is a model that uses a distributed runoff curve number approach. Runoff curve numbers were selected using the Wildcat5 User's manual, the posted "Burned Area Emergency Response Tools" https://forest.moscowfsl.wsu.edu/BAERTOOLS/ROADTRT/Peakflow/CN/supplement.html, and professional judgment. The pre-fire runoff from a 10-yr, 24-hr storm of 2.0 inches is approximately 17 cfs/square mile, with a post-fire flow model estimate of 69 cfs/square mile averaged across 12 modelled poursheds. Post-fire runoff, especially in the first few precipitation events, will likely be bulked with ash, bedload, sediment and debris, and result in flows with a higher specific gravity due to ash in the water column. Flows may become hyper-concentrated flash floods until vegetation has re-established in the burned areas. Using a bulking factor of 25%, the estimated peak flow increases from 1.6 to 5 times the pre-fire estimated flows, depending on drainage area, soil burn severity, soil erosion risk rating, slope and vegetative cover. The greatest impacts are most likely to occur in the first year or two following the fire.

The primary threat to values at risk for hydrology are associated with flooding, debris flows, and sedimentation as a result of altered soil hydrologic function and slope stability associated with burned soils and vegetation. Hydrologic changes induced by wildfire that can impact values at risk include reductions or elimination of rainfall interception, transpiration, litter storage of water, and infiltration. These reductions typically result in greater runoff, increased overland flow, increased streamflows, increased water yields and increases in stormflow. In addition to increased flows, as root strength is lost from wildfire induced tree mortality, slopes stability decreases leading to higher susceptibility to landslide or debris flows.

Increased flows are expected to result in sedimentation and/or scour of channels and are likely to occur at an accelerated rate until vegetation establishes itself and provides ground cover. Streams with high SBS occur as steep channels, confined in narrow canyons and these are natural sediment source and transport reaches. However, several factors favor a quick recovery in terms of normal hydrologic response of some hillslopes. The existence of fine roots in the low and moderate severity burn areas just below the surface will likely aid plant recovery and will serve as a seed source for natural vegetation recovery. The major concern for hydrologic recovery is development of ground cover and vegetative recovery in the moderate and high soil burn severity areas.

Small headwater drainage basins (< 5,000 acres) with high SBS are expected to exhibit the highest amount of runoff on a unit basis (cfs/mi2). The downstream accumulation of flow is not proportionately additive, because as the drainage area increases in the downstream direction, more and more of the area becomes dominated by unburned to low SBS, which would not alter runoff processes. Depending on the intensity, amount and duration of rainfall immediately post-fire, there could be pulses of sediment-laden flows that can cause localized impacts to stream channels, such as excess scour and deposition. This is expected to be a short-term effect that will persist for the next three to five years and natural recovery is recommended as the most effective and low-cost treatment.

b. **Native and naturalized plant communities**, where invasive species or noxious weeds are absent or present in minor amounts, are at risk of invasion by documented and newly introduced non-native invasive species. Many of these invasive plants are on the State of Washingtons noxious weeds list and are adjacent to areas of high and moderate SBS, and areas disturbed by suppression activities. Noxious weed infestations pose a serious threat to the composition, structure, diversity and function of native plant communities. Crown canopy was highly reduced to eliminated (moderate to high intensity burned areas); as was shrub and forb cover in the understory but the majority of the acres burned were non-forested habitats dominated by bunchgrsses and forbs. These disturbed areas are now highly vulnerable to noxious weed spread from existing infestations or adjacent sources, as well as to the introduction of new invaders brought in by suppression equipment and activities. Invasive plants of concern include rush skeleton weed, Spotted and meadow knapweed, Canada thistle, scotch thistle, white top and annual grasses including cheatgrass medusahead rye and ventenata.

c. **Threatened and Endangered Fisheries and Wildlife** species exist within the burn area. Species of concern include fish. Increased habitat degradation and juvenile and sub-adult mortality of Bull Trout, Steelhead and Chinook Salmon is possible due to accelerated sedimentation, loss of stream shade and large wood, and potential accelerated channel erosion mostly focused in the North Fork Asotin River. Road and trail related treatments will mitigate additional sedimentation due to road fill failures and lack of drainage capacity. Fish and wildlife specific actions are more long-term where strategic assessments are needed to inform actions. There are no specific treatment recommendations for fisheries at this point, other than those already recommended by hydrology, engineering and recreation (i.e. storm proofing road features, stabilizing fill slops, storm inspection and response, road/trail stabilization, resting

grazing allotments).

There is a federally listed threatened plant species within the fire perimeter, *Silene spaldingii,* Spaldings catchfly with habitat that burned with low and moderate severity. Approximately 143 acres of occupied habitat was burned and is now suseptible to further degradaton, particulary from the invasion of nearby noxious weeds. This habitat is designated as a Key Conservation Area for Spalding's catchfly and that designation requires that 80% of the habitat is composed of native plant cover. Because the entire Key Conservation Area was burned there is little to no native vegetation cover to compete with the more aggressive non-native species on site. We are proposing aerial seeding the burned habitat with native bunchgrass species including Idaho fescue (*Festuca idahoensis*) and bluebucnh wheatgrass (*Psuedoroegneria spicata*) which was locally sourced from this particular area, as well as EDRR for noxious weeds trying to establish in this threatened habitat. Resting allotments that contain Spaldings catchfly will be critical to the recovery of these populations.

d. Soil Productivity - Reduced vegetative ground cover, altered surficial soil structure resulting in reduced water infiltration, and slight increase of soil hydrophobicity following wildfire increases the risk of soil erosion and mass wasting in the area. Almost 2/3 of the soils in the area naturally contain a slightly decomposed plant horizon (Oa or Oe horizons) providing a protective covering to the mineral soil from erosion due to rain fall, sheet erosion, or gullying. High and moderate soil burn severity areas are missing the protective organic horizon. Absence of the organic horizon increases the potential for sheet and rill erosion, isolated debris and mud flows, and isolated slumping that decreases soil productivity in the area and contribute to sediment delivery in streams to some degree. In some cases, the risks may persist for several years after fire.

Low soil burn severity (SBS) areas are generally stable maintaining soil productivity and act as buffers between high and moderate SBS areas. High and moderate SBS areas cause the greatest concern for decreased soil productivity and sediment delivery to streams, especially when they connect surrounding backslopes to the stream system. High and moderate SBS disturbance resulted in changes of the first 1 to 2 cm of surface soil structure, leaving soil structure intact below. Surface soil structures altered by fire to loose, single grain structure and organic ash from consumed vegetation are the greatest sources of soil derived sediment from mountain backslopes. Primary sediment potential is from the top centimeter or two on high SBS soils but as energy increases down slope erosion can scour deeper into the soil profile increasing sediment movement. Landforms in the area holding thick volcanic ash deposits have slopes less than 35%. Steeper slopes hold thinner soil profiles and are more susceptible to soil erosion and have greater negative effects to soil productivity due to their thin nature. Anticipated mass wasting events on steep slopes should be small and isolated due to the discontinuous nature of soil development on the landscape with regular rock outcrop and repeated changes in slope from the mountain tops to drainages.

Areas of high soil burn severity and steep slopes have geomorphic surface features that add to and detract from soil erosion throughout the burn area. Some areas have a high rock cover content protecting and holding loose soil to the local area, while others lack the protective rock content on the surface or in the upper soil profile. Most high an moderate SBS areas have 10 to 20 percent large dead and down wood on the landscape increasing the potential for sediment capture or holding in place. As more charred trees fall, that cover increases and so does sediment retention potential. Some steep slope areas with high SBS contain small 1 foot wide benches behind vegetative growth that hold and accumulate soil erosion. These areas have a greater potential for maintaining soil productivity as sprouted vegetation continues to grow.

Some areas in the fire parameter were identified as timber sales and now are possible future areas for salvage sales. Soil disturbance in areas where slopes exceed 35% and lack ample rock cover or dead and down cover are prime areas for increased sediment delivery to the stream system during and after harvest regardless of SBS rating. Less sloping areas with low

and moderate SBS mosaic are prime areas for salvage and can handle related disturbance because discontinuous nature of the burn mosaic. Maintaining a disconnected trend of soil disturbance provides areas of soil accumulation on the landform before sediment can reach the stream system.

4. **Cultural and Heritage Resources:** Cultural resources at risk include traditional use areas, prehistoric lithic scatters, rockshelters, mining and railroad camps, mills and historic trails. Of those that qualify as BAER Critical Values, there are no sites that are at risk to looting and/or degradation from erosion.

B. Emergency Treatment Objectives:

Proposed Land Treatments
The objective of the land treatments are to:

1. Promote and protect native and naturalized vegetative recovery by reducing the spread of noxious weeds **(P1a, P1b, P2, P3).**
2. **Note -** No active land treatments are recommended for long-term soil productivity. Allowing for natural recovery is the recommended course of action.

Proposed Road and Trail Treatments
The objective of the road and trail treatments are to:

1. Protect road and trail investments from becoming impassible and damaged due to increased post-fire runoff (**R1a, R2, R13, T1**).
2. Reduce sedimentation into streams egrading water quality important for T&E Fish species (**R1a, R2, R13, T1**).

Proposed Protection/Safety Treatments:
The objective of the protection/safety treatments are to:

1. Protect human life and safety by raising awareness through posting hazard warning signs at recreation sites and trailheads. (**S1a, S1b**)
2. Posting of hazard warning signs along various forest service roads and trails to warn users of potential hazards resulting from post-fire conditions (**P1a, P1b, P2**)
3. Protect worker and public safety by removing hazard trees associated with BAER treatments and within the vicinity of road, trail and hazardous material mitigation BAER treatment sites (**R1a, R2, R13, T1**)
4. Interagency Communication essential to coordinate access between WDFW and NFS in order to coordinate public messaging between land managers. This treatment will help in the coordination and communication of management of rangeland between the Forest Service and WDFW. (**S10)**
5. Protection of Forest Service investments and recreation infrastructure (**S3**).

Proposed Treatment Effectiveness Monitoring:

1. The objective of treatment effectiveness monitoring is to evaluate how effective the aerial seeding treatment is in reducing the post-fire insavsive weed spread into critical for Spalding's catchfly. **(M1)**

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

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	85	90
Channel	90	80	90
Roads/Trails	80	85	90
Protection/Safety	80	90	90

E. Cost of No-Action (Including Loss): $831,225 (Not including threat to human life and safety) If no action is taken for the Key Conservation Area of the federally listed plant species Spalding's catchfly, there is a risk this population will be extirpated.

F. Cost of Selected Alternative (Including Loss): $282,974 (Assuming 15% Loss)

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Kyle Wright
Email: kyle.wright2@usda.gov **Phone(s)** 458-292-6027

Forest BAER Coordinator: Brien Park
Email: brien.park@usda.gov **Phone(s):** 541-969-3342

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

Skill	**Team Member Name**
Team Lead(s)	Kyle Wright
Soils	Brien Park
Hydrology	Zig Napkora
Engineering	Justin Nettleton
GIS	Zach Adams
Archaeology	Will Marquardt
Weeds	Krista Farris, Megan Chapman
Recreation	Kenny Bott, Andy Augir
Fisheries	Bill Dowdy

H. Treatment Narrative:

Land Treatments:

P1a. / P1b. Invasives EDRR and Invasives EDRR Suppression:
Early Detection Rapid Response (EDRR) treatment of high priority non-native invasive plant species is proposed for the Key Conservation Area of Spalding's catchfly *(Silene spaldingii)* which is listed as threatened under the Federal Endangered Species Act. This threatened species occupies 143 acres and is at high risk of being extirpated by non-native invasive plants. By surveying the habitat and treating non-native invasive plants immediately after the fire as well as aerial seeding with native bunchgrasses we will mitigate this risk. We are also recommending EDRR treatments for R6 Sensitive plant habitat that burned at moderate and high SBS to reduce the risk of rapid invasion of non-native species into these important native plant communities (155 acres). EDRR treatments are also proposed for the Charlie Creek Special Interest Area (SIA) which was designated as a special botanical area and burned completely in the Lick Creek Fire (37 acres). Finally EDRR treatment as well as manual seeding with native grasses is proposed for Forest Service roadsides used for fire suppression activities that burned with moderate to high severity and have non-native invasive plant infestation

nearby. Roads are major vectors for the introduction and spread of invasives and early detection and treatment as well as quickly establishing native grasses will help prevent new infestations from invading newly burned ground.

EDRR for Dozerlines, staging areas, drop points and other ground disturbance caused by fire suppression activities is also proposed here under suppression. The likelihood that heavy equipment working on the fire brought in propagules from outside the Umatilla National Forest is high. Early detection and treatment will help prevent new invasive species from getting established in these disturbed areas.

Treatment	Units	Unit Cost	# of Units	Total Cost
P1a. - Invasives EDRR	Acres	100	367	$36,700
P1b. - Invasives EDRR-Suppression	Acres	100	55	$5,500

P2. Preventive Seeding for Invasive Species:

Seeding with locally sourced native bunchgrass species is proposed for the Key Conservation Area (KCA) occupied by *Silene Spaldingii,* a plant species listed as Threatened under the Federal Endangered Species Act. Seeding with native species such as Idaho fescue (*Festuca idahoensis*) and Bluebunch wheatgrass (*Psuedoroegneria spicata*) in the fall of 2021, combined with invasive plant surveys and treatment in the spring and summer of 2022, within the Spalding's catchfly populations will greatly reduce the risk of noxious weed invasion. Native bunchgrass will quickly occupy the denuded ground and preempt the habitat from being colonized by non-native invasives. The cespitose growth form of the native bunchgrasses allows for interstitial spaces to be colonized by Spalding's catchfly and other native forbs. The Key Conservation Area designation is determined based on having at least 80% of the vegetation cover composed of native species as well as intact habitat adjacent to the conservation area for pollinators. The best way to reach this criteria is to seed the Key Conservation Area with native bunchgrasses this Fall 2021 to allow for germination and establishment by spring of 2022. The Umatilla National Forest has collected native seed from the KCA and surrounding areas and increased seed production with a local grower at Jerry Bensen farms (BFI). There is excess seed available for purchase and can be spread in a timely matter to meet the BAER requirements of effective treatment within one year post fire. Aerial seeding is recommended in the Key Conservation Area because the Canyon Grasslands are the steepest and least accessible regions where Spalding's catchfly is found. Slopes range from flat areas to as great as 70 percent (Usfws 2007). This makes ATV seeding a challenge, not only are slopes too steep to safely operate an ATV, but there is also limited road access.

Seeding with an appropriate native seed mix in areas with high to moderate SBS adjacent to roads used as major travel routes to access the fire, will greatly reduce the risk of introduction and spread of non-native invasive plant infestations into the surrounding native plant communities. Roadside seeding with ATV's at a rate of 20lbs/acre combined with EDRR within the first year post fire is the most effective way to protect native plant communities. All seed used to prevent the establishment of noxious weeds on Forest Service lands has been collected from the Umatilla National Forest from the appropriate seed zone and grown out for propagation. Local genetic variation helps ensure successful establishment and adaptation to local conditions. Species of seed that will be used in the Lick Creek fire include Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (*Psuedoroegneria spicata*).

Treatment	Units	Unit Cost	# of Units	Total Cost
P2. Preventive Seeding for Invasive Species (Aerial seeding in KCA 12lbs/acre)	Acres	340	143	**$48,620**
P2. Preventive seeding for invasive species (Ground based roadside trt 20lbs/acre)	Acres	380	32	**$12,160**

P3. Other Invasive Species Treatments (Resting Grazing Allotments):
Recommend resting the following range allotments for a year following the fire and reevaluate into the future:

- Allotment Names: Peola, Macke, Asotin

Channel Treatments: None Proposed

Roads and Trail Treatments:
Only those FS roads and trails within or below areas burned at moderate or high SBS and have increased risk of damage due to post-fire conditions, are recommended for emergency response. Proposed treatments are designed to improve drainage at drainage crossings and along adjacent slopes in order to remove higher levels of runoff from trails and roads before extensive damage or loss of infrastructure can occur. Roads and trails were designed to be practical, economic treatments to mitigate risk to acceptable levels.

R1a. Road Drainage (storm proofing existing drainage features): This treatment includes storm proofing drainage features identified for critical value roads that are susceptible to damage or failure due to increase post-fire flows. Activity will include cleaning culverts and ditches, catchment basin and lead-out ditch capacity where they exist, road berm or ditch slump removal, and replacement of burn-out drop inlet covers as necessary to handle post-fire flows, sediment and debris**.** Includes FS Roads 41, 4100160 and 4100163.

Treatment	Units	Unit Cost	# of Units	Total Cost
R1a. Road Drainage	Miles	$3,150.00	16.3	$51,345.00

R2. Storm Inspection and Response: Storm inspection and response will keep culvert and drainage features functional by cleaning sediment and debris from in and around features between and/or during storms. Increase the frequency of storm inspections and availability of equipment to clean out culvert inlets based on local weather forecasts. This work will be accomplished through Forest Maintenance Contract, equipment rental, and general labor. Includes FS Roads 41 and 4206.

Treatment	Units	Unit Cost	# of Units	Total Cost
R2. Storm Inspection and Response	Day	$2,105.00	8	$16,840.00

R13. Fill-Slope Stabilization: This work consists of repairing unstable slopes that have a high erosion potential due to increased runoff. Excavate and remove any remaining woody debris in the fill slope holes and backfill and compact material in place of the voids. In some cases, to prevent further damage, riprap is required to stabilize the fill slope. Location on FS Road 4100160

Treatment	Units	Unit Cost	# of Units	Total Cost
R13. Fill-Slope Stabilization	Each	$3,000.00	1	$3,000.00

T1. Trail Drainage: 9.8 miles of the total 48.5 mile of trail will require drainage treatments due to increased water compromising trail tread. Work will include installing drainage (rolling grade dips, grade reversals), step-down drain installations (armored drainage crossings), restoring out slope, re-establishing tread, replacing damaged retaining structures where necessary, and snagging trees as appropriate for worker safety.

Treatment	Units	Unit Cost	# of Units	Total Cost
Trail Name/ Number				
Hard-To-Get-To Trail 3115	Miles	$3,000	1.91	$5,730
NF Asotin Creek TR 3125	Miles	$3,000	4.07	$12,210
Pinkham Trail 3128	Miles	$3,000	0.49	$1,470
Red Hill Gulch Trail 3144	Miles	$3,000	3.30	$9,900
Grand Total			9.77	**$29,310**

Protection/Safety Treatments:

Treatments are specifically designed to protect the public, employees, contractors and municipal waters from immediate threats as a result of the fire. Threats include hazard trees, rock fall, potential flood and debris flows, and hazardous materials.

S1a. Road Warning Signs: Signs will inform users of the dangers associated with entering and recreating within the burned area.

Treatment	Units	Unit Cost	# of Units	Total Cost
P1a. Road Hazard Signs	Sign/Post	$800.00	8	$6,400.00
P1a. Road Closure Signs	Sign/Post	$700.00	13	$9,100.00
Grand Total				**$15,500**

S1b. Trail/Recreation Hazard Signs: This cost estimate is for placing information boards and posting hazard related signs to notify the public of post fire hazards and maintenance for one year (see treatment map for locations). Hazard Sign Placement at the following locations: Wickiup CG, Misery warming shelter, Clearwater recreation area, dispersed recreation sites along the 42 and 44 road. Trail/ Recreation hazard signs to placed at trail heads and

Treatment	Units	Unit Cost	# of Units	Total Cost
S1b. Trail/Recreation Hazard Signs	Sign/Post	$200	7	$1,400
S1b. Trail/Recreation Closure Signs	Sign/Post	$200	8	$1,600
Total Cost				**$3,000**

S2. Road Closure Devices: Jersey Barriers will discourage public use of high risk areas due to the potential for post-fire risks associated with danger trees, flooding and other debris.

Treatment	Units	Unit Cost	# of Units	Total Cost
S2. Road Closure Device (Ecoblocks)	Each	$2,500.00	3	$7,500.00
S2. Road Closure Device (Gate)	Each	$8,000.00	1	$8,000.00
S2 Road Closure Device (Temp Gate)	Each	$3,000.00	2	$6,000.00

S3. Hazard Trees (developed sites): This treatment will mitigate hazard trees from falling and damaging Forest Service properties with significant economic value such as large picnic shelters and toilets.

Treatment	Units	# of Units	Unit Cost	Total Cost
S3. Hazard Trees – Misery Ridge Warming Shelter	Each	15	$60	$900

S10.Interagency Communication: This treatment is essential to coordinate access between WDFW and NFS in order to coordinate public messaging between land managers. This treatment will help in the coordination

and communication of management of rangeland between the Forest Service and WDFW. This cost was requestion in addition to base salary.

Treatment	Units	# of Units	Unit Cost	Total Cost
S10. Interagency Communication	Days	5	$500	$2,500

I. Monitoring Narrative: All treatments will be monitored for effectiveness and are included in the treatment costs except aerial seeding in the Key Conservation Area, which will be monitored in 46 permanent plots that were already established within the KCA before the fire. Cost estimated for monitoring aerial seeding in plots data analysis, QA/QC, and monitoring report. (see botany specialist report for monitoring details).

Treatment	Units	# of Units	Unit Cost	Total Cost
M1. Aerial Seeding Effectiveness Monitoring	Lump	1	$4,500	$4,500

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

			NFS Lands	
		Unit	# of	
Line Items	Units	Cost	Units	BAER $
A. Land Treatments				
P1a. Invasives EDRR	Acres	100	367	$36,700
P1a. EDRR Suppression	Acres	100	55	$5,500
P2. Seed for T&E Protection	Acres	340	143	$48,620
P2. Preventive Seeding	Acres	380	32	$12,160
Subtotal Land Treatments				$102,980
B. Channel Treatments				
C. Road and Trails				
R1a. Road Drainage	Miles	3,150	16	$51,345
R2. Storm Inspection and Response	Miles	2,105	8	$16,840
R13. Fill-Slpoe Stablization	Each	3,000	1	$3,000
T1. Trail Drainage	Miles	3,000	10	$29,310
Subtotal Road and Trails				$100,495
D. Protection/Safety				
S1a. Road Hazard Signs	Sign/Post	800	8	$6,400
S1a. Road Closure Signs	Sign/Post	700	13	$9,100
S1b. Trail/Rec Hazard Signs	Sign/Post	200	7	$1,400
S1b. Trail/Rec Closure	Sign/Post	200	8	$1,600
S2. Ecoblocks	Each	2,500	3	$7,500
S2. Gate	Each	8,000	1	$8,000
S2. Temp. Gate	Each	3,000	2	$6,000
S3. Haxard Trees (Developed Site)	Each	15	60	$900
S10. Interagency Coordination	Day	500	5	$2,500
Subtotal Protection/Safety				$43,400
E. BAER Evaluation				
Initial Assessment	Report			$44,752
				$0
Subtotal Evaluation				$44,752
F. Monitoring				
M1. Aerial Seeding Effectiveness	Lump	$4,500	1	$4,500
Subtotal Monitoring				$4,500
G. Totals				**$251,375**
Previously approved				
Total for this request				**$251,375**

PART VII - APPRORVALS

08/05/2021

Forest Supervisor Date