Date of Report: 5/15/2019
Interim #1

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[X] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[ ] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

[X] 2. Interim Report #1 Items are in Blue Font
[X] Updating the initial funding request based on more accurate site data or design analysis
[ ] Status of accomplishments to date

[ ] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Maple

B. Fire Number: 00207

C. State: WA

D. County: Mason

E. Region: 6

F. Forest: Olympic

G. District: Hood Canal

H. Fire Incident Job Code: P6L2NE

I. Date Fire Started: 8/4/2018

J. Date Fire Contained: 10/5/2018

K. Suppression Cost: $4.7 M, as of 10/5/18

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 0.25
2. Fireline seeded (miles): NA
3. Other (identify): Suppression rehab to clean woody debris from ditches along 2500, 2480; surface grading along 2480 and 2401

M. Watershed Number: 171100180202 – Hamma Hamma River / 171100180201 Jefferson Creek

N. Total Acres Burned: 3300
NFS Acres(2990) Other Federal ( ) State (310) Private ( )

O. Vegetation Types: Fire primarily burned in the Western Hemlock Zone, plants associated in this area are sword fern, Oregon-grape, salal, rhododendrons, huckleberry, and devil's club. Higher elevation ridgetops burned in the Pacific Silver Fire Zone and a variety of huckleberry are associated with this area.

P. Dominant Soils:
The dominant soil order within the fire perimeter are Andisols with medial and/or lithic modifiers. Dominant soil textures are moderately coarse sandy loams, with fine sandy loams concentrated on lower toeslopes and low terraces. Soils within the burned area generally have extremely high rock content throughout the profile, ranging from 35% to 90%. Unconsolidated materials and highly fragmental (>90% rock fragments) shallow soils comprise over 50% of the fire perimeter.

Q. Geologic Types:

The Maple fire environment is dominated by rock outcrop, talus/scree slides, and shallow soils. There is some evidence of recent shallow landslides and debris flows, with these generally being contained to mid-backslope positions. Existing drainage ways are very narrow and over steepened and are generally bedrock controlled. Dominant lithology within the fire perimeter is mainly marine basalt with some sandstone sedimentary inclusions.

R. Miles of Stream Channels by Order or Class: Perennial streams 6.7 mi., Intermittent 20.5 mi.

S. Transportation System:

Trails: 3.4 miles Roads: 6.0 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Severity	Acres Burned	Percent
High	98	3%
Moderate	458	14%
Low	818	25%
Unburned/V. Low	1898	58%
Total	3273	

B. Water-Repellent Soil (acres):

The BAER team was unable to conduct in depth field testing of soil water repellency across all areas of the fire due to hazardous field conditions and safety concerns regarding the high number of very tall snags that were observed by the Agency Administrator and Incident Commander. No firefighters or BAER personnel were allowed on the steep slopes deep in the interior of the fire. The extent of water repellent soils is estimated to be 139 acres or 5% of soils. (100% high and 50% of moderate burn severity areas).

C. Soil Erosion Hazard Rating (acres):
34 (low) 42 (moderate) 3099 (high)

D. Erosion Potential:

ERMIT – 8.28 tons/acre

E. Sediment Potential: 348 cubic yards / square mile

F. Debris Flow Potential: The USGS preliminary debris hazard assessment predicted the likelihood of debris flow (%), potential volume of debris flow (m3), and combined relative debris flow hazard based upon a design storm. Much of the burn area is estimated to have a low to moderate to high potential for post-fire debris flow occurrence. There are a few steeper, more severely burned subwatersheds thathave a high (> 50%) likelihood of debris-flow initiation in response to a relatively modest 15-minute peak storm intensity of >20 mmh^{-1} Predicted magnitudes for these higher likelihood tributaries are largely expected to be between 1,000 and 10,000 m^3, with only one small watershed having an estimated volume in excess of 10,000 m^3.

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 3 – 5 years

B. Design Chance of Success, (percent): 70%

C. Equivalent Design Recurrence Interval, (years): 5

D. Design Storm Duration, (hours): 3 hours

E. Design Storm Magnitude, (inches): 2.5 inches

F. Design Flow, (cubic feet / second/ square mile): 133

G. Estimated Reduction in Infiltration, (percent): 27%

H. Adjusted Design Flow, (cfs per square mile): 376

PART V - SUMMARY OF ANALYSIS

The Maple Fire was discovered on 8/4/2018 and has burned approximately 3300 acres within the Jefferson Creek tributary to the Hamma Hamma watershed near Brinnon, WA on the Hood Canal Ranger District. Several main roads imperative to USFS and DNR land management, and a secondary road with critical safety access to a USFS radio repeater were evaluated. Two trails were also identified to be evaluated when conditions are safe to do so. The area is characterized by mostly inaccessible and steep terrain. The soil burn severity map shows that 17% of the fire burned at high and moderate soil burn severity. The rest of the fire was either low soil burn severity or unburned. Increased postfire soil erosion, runoff and debris flows within the burned area is likely to cause flooding on roadways and depostion of materials on the road prism. This area is very steep and there already has been substantial dry ravel and burnt tree debris deposition onto roads. This process is expected to continue throughout the winter and the concern is that road drainage could be overwhelmed and water could be diverted down the road causing extensive damage to the road prism and road fill. Long duration winter storms are the primary precipitation events of concern. Based on historic precipitation patterns, most of the damage producing storm events occur in November through January. Every concave feature on the steep slopes has the potential to transport large volumes of water pre-burn, these drainages are expected to convey larger volumes of water post fire and likely overwhelm the road drainage structures. All three roads in the burned area were maintained before the fire and will be graded for surface drainage with suppression funds. Hillslope recovery of pre-fire stability and watershed hydrologic response is expected within 3 years following the fire.

A. Describe Critical Values/Resources and Threats:

This area is easily accessible from Olympia, visitors to the Olympic Peninsula/National Park and the greater Seattle area due to paved road access from Highway 101 up to the fire perimeter. Potential impacts on human life and safety, property, natural resources and cultural resources were identified by the local District/BAER team. Disciplines that identified critial values participated in an initial BAER field survey. The BAER team assessed the the area for post-fire emergencies and identified the following threats to critical values. Interim reports may be submitted as additional assessments are completed in the interior of the fire along the system trails and/or the need to repair or maintain BAER treatments emerges.

The risk matrix, Exhibit 2 of Iterim Directive No 2520-2018-1, (see below) was used to evaluate the Risk Level for each value identified during the assessment. The project file on Pinyon has all specialist reports, maps, photos and relevant project information.

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**

The following critical values table is the summary of the critical values that were identified within or immediately adjacent to the Maple Fire.

Maple BAER - FS Critical Values Table							
High / Very High Risk							
Intermediate Risk							
Low / Very Low Risk							
Life/ Property/ Resources	**Critical Value**	**Threat to Value**	**Probability of Damage or Loss**	**Magnitude of Consequence**	**Risk**	**Treatment**	**Notes**
Property (2019 – Interim#1)	Lower Elk Lake Trail, #805	Potential of elevated runoff and water diversion down the trail; loss of trail tread; soil erosion and debris from very steep mod/high SBS slopes along trail	**Interim #1 - Likely** - there are numerous ephemeral drainages and hillslopes that have had elevated runoff and erosion this winter – the hillslope is very steep and therefore hydrologic recovery is expected to be slow and the threat to the Elk Lake trail persists.	**Moderate** - damage or loss of trail prism	**High**	Storm proofing measures on 3 miles of the Elk Lake trail system: (1) improvement/armoring of approximately 20 ephemeral drainages to prevent head cutting and loss of trail tread; (2) installation of approximately 10 additional rolling dips; (3) fill slope protection where necessary. Note: storm proofing treatments include cutting logs out as necessary by the Fire Crew to make the work sites accessible and free of hazard trees and to allow for safe crew egress in case of emergency.	The trails have been inspected spring 2019 – due to steep side slopes and likely increased overland flow -drainage features and fill protection measures to protect trail tread are needed. In addition to protecting the trail itself, these stabilization measures will also reduce detrimental effects to downstream values at risk.
Human Life & Safety	Intersection of open road FSR 2500 and closed road FSR 2480	Potential exposure of public and employees to hazard trees, rock fall, debris flow, flooding	**Possible** - there are numerous very tall trees and small rocks and boulders; Very steep drainages with some high and moderate burn severity	**Major** - falling trees and rocks could result in injury or loss of life	**High**	Install gate and burned area warning signs at intersection of FSR 2500 and FSR 2480. Gate is necessary to allow USFS access to main road into the burn area for monitoring and land management. Use signage to reinforce that this is not a vehicle closure - this area is closed to all users.	
Human Life & Safety	Intersection of open section of FSR 2480 and closed road FSR 2401	Potential exposure of public and employees to hazard trees, rock fall, debris flow, flooding	**Possible** - there are numerous very tall trees and small rocks and boulders; Very steep drainages with some high and moderate burn severity	**Major** - falling trees and rocks could result in severe injury or loss of life	**High**	Install gate and burned area warning signs at intersection of FSR2480 and FSR2401. Gate is necessary to allow USFS admin/DNR access to their land for salvage logging. Use signage to reinforce that this is not a vehicle closure - this area is closed to all users.	
Human Life & Safety	Open road FSR 2441 before it drops into fire area	Potential exposure of public and employees to hazard trees, rock fall, debris flow, flooding	**Possible** - there are numerous very tall trees and small rocks and boulders; Very steep drainages with some high and moderate burn severity	**Major** - falling trees and rocks could result in severe injury or loss of life	**High**	Install ecoblock closure and burned area warning signs at top of ridge before the narrow road drops down into the intersection with FSR2401 and a poor turn around. Use signage to reinforce that this is not a vehicle closure - this area is closed to all users.	
Human Life & Safety	System Hiking Trails- Upper Elk Lake, Lower Elk Lake, Jefferson Ridge; Trailhead Parking/Dispersed Camping	Potential exposure of public and employees to hazard trees, rock fall, debris flow, flooding	**Possible** - there are numerous very tall trees and small rocks and boulders; Very steep drainages with some high and moderate burn severity	**Major** - falling trees and rocks could result in severe injury or loss of life	**High**	Install burned area warning and hazard signs at trailheads to inform public of potential threats - plan to open next summer; Area closure will be in effect with gates at all unburned intersections until winter storms have passed to protect users from debris flow and flooding	
Property	FSR 2480 Road Prism - ML3 - 1.2 miles	High potential for elevated runoff from mod/high SBS hillslopes above could overwhelm existing drainage features, could divert water onto road and cause loss of road fill. High potential of bulked burnt trees, dry ravel and rock debris in ephemeral channels inundating the road, plugging the culverts and rendering all drainage ineffective.	**Likely** - flood modeling in representative drainages and professional judgement from recent ERFO events predict a substantial increase in the amount of material that will render road drainage ineffective	**Moderate** - damage or loss of road prism; increased sediment into Hamma Hamma River, critical fish habitat; Main admin & DNR access route.	**High**	Install (6) armored rolling dips on ML3, to add culvert cross drain redundancy; storm inspection and response	

Property	FSR 2421 Road Prism - and access to Jefferson Ridge Repeater Site - ML2 - 4.5 miles	High potential for elevated runoff from mod/high SBS hillslopes above could overwhelm existing drainage features, could divert water onto road and cause loss of road fill. High potential of bulked burnt trees, dry ravel and rock debris in ephemeral channels inundating the road, plugging the culverts and rendering all drainage ineffective.	**Likely** - flood modeling in representative drainages and professional judgement from recent ERFO events predict a substantial increase in the amount of material that will render road drainage ineffective	**Moderate** - damage or loss of road prism; Access route to Jefferson Ridge Radio Repeater	**High**	Install (3) water bars to add culvert cross drain redundancy; storm inspection and response	
Property	FSR 2401 Road Prism - ML3 - 8.6 miles	High potential for elevated runoff from mod/high SBS hillslopes above could overwhelm existing drainage features, could divert water onto road and cause loss of road fill. High potential of bulked burnt trees, dry ravel and rock debris in ephemeral channels inundating the road, plugging the culverts and rendering all drainage ineffective.	**Likely** - flood modeling in representative drainages and professional judgement from recent ERFO events predict a substantial increase in the amount of material that will render road drainage ineffective	**Moderate** - damage or loss of road prism; increased sediment into Jefferson Creek, tributary to Hamma Hamma critical habitat; public access road	**High**	Install (6) armored rolling dips, to add culvert cross drain redundancy; storm inspection and response	
Property	Jefferson Ridge Trail, #808	Potential of elevated runoff and water diversion down the trail; loss of trail tread; soil erosion and debris from very steep mod/high SBS slopes along trail	**Possible** - there are numerous ephemeral drainages that will have elevated runoff from over 100 inches of rain that fall in this area	**Moderate** - damage or loss of trail prism	**Intermediate**	Intermediate risk does not warrant treatment	Due to safety concerns, trails have not been inspected yet for dry ravel and debris deposition and trail drainage issues; potential treatment - additional drainage features to protect trail tread.
Property	Lower Elk Lake Trail, #805	Potential of elevated runoff and water diversion down the trail; loss of trail tread; soil erosion and debris from very steep mod/high SBS slopes along trail	**Possible** - there are numerous ephemeral drainages that will have elevated runoff from over 100 inches of rain that fall in this area	**Moderate** - damage or loss of trail prism	**Intermediate**	Intermediate risk does not warrant treatment	Due to safety concerns, trails have not been inspected yet for dry ravel and debris deposition and trail drainage issues; potential treatment - additional drainage features to protect trail tread.
Property	Upper Elk Lake, #805.1	Potential of elevated runoff and water diversion down the trail; loss of trail tread; soil erosion and debris from very steep mod/high SBS slopes along trail	**Possible** - there are numerous ephemeral drainages that will have elevated runoff from over 100 inches of rain that fall in this area	**Moderate** - damage or loss of trail prism	**Intermediate**	Intermediate risk does not warrant treatment	Due to safety concerns, trails have not been inspected yet for dry ravel and debris deposition and trail drainage issues; potential treatment - additional drainage features to protect trail tread.
Property	Jefferson Creek Bridge - FSR2480	Potential scouring of brudge abuttments during high flows, debris dam, flooding and impoundment at bridge, damage to abutments from mobilized debris	**Possible** - bridge is below mod/high sbs with substanial debris (burnt trees) already bulking in ephemeral drainages	**Major** - loss of bridge investment	**High**	Storm Inspection as part of FSR 2480 inspection	
Property	Hamma Hamma River Bridge - FSR2480	Potential debris dam, flooding and impoundment at bridge, damage to abutments	**Unlikely** - bridge is below Low/Unburned SBS	**Major** - loss of bridge investment	**Intermediate**		

Natural Resources	Native Plants; special plant communities - unique herbaceous balds	Loss of native plants; Several disturbance corridors within the burned area (roads and trails) have the potential to serve as dispersal routes for weed propagules to be introduced into the Maple fire burn area. These include the 2401 and 2421 roads, and the Elk Lake, Elk Lake South and Jefferson Ridge trails. These sites currently have sporadic, very low levels of infestation, but other areas in the Maple fire burn area and in the vicinity do have significant issues related to invasive plants.	**Very Likely**	**Major**	**Very High**	Early Detection Rapid Response treatment; Weeds prevention seeding	The herbaceous bald plant communities present in the burn area are fragile habitats and are susceptible to invasion by weeds, particularly in this case, Scotch broom and cheatgrass. If these balds were invaded by either of these weeds, damage would be irreversible and severe because of the inaccessibility of the balds. Native species in this type of habitat would be displaced by the weeds, permanently altering and degrading these unique plant communities.
Natural Resource	Salmon critical habitat - Hamma Hamma River	Loss of Critical Habitat due to excess sedimentation and debris flow; increase turbidity and duration and magnitude of sediment load.	**Possible** – ESA critical fish habitat is more than 4 miles downstream of fire	**Moderate** – short term negative impacts form sediment, however long term improvement to habitat complexity from increase wood	**Low**	Low Risk to resource does not warrant treatment	Post-fire processes are expected to deliver elevated pulses of sediment and wood to streams, in the short term (within three years). No treatments are recommended to mitigate this natural process. Short term negative impacts to fish from increased sediment, however a long term benefit to fish habitat from increased levels of wood.
Natural Resources	Soil Productivity	Potential loss of soil from increased erosion and debris flows	**Likely**	**Minor**	**Low**	Low Risk to resource does not warrant treatment	
Natural Resources	Watershed - Hydrologic Function	Increased runoff in ephemeral, intermittent and perennial streams and sediment depostion	**Likely**	**Minor**	**Low**	Low Risk to resource does not warrant treatment	
Cultural Resource	Unknown Cultural Resource Sites	Potential loss from sediment depostion; scouring and debris covering sites. Looting, vandalisim and potential exposure. Loss of scientific data affecting eligibility.	**Unlikely**	**Major**	**Intermediate**	Intermediate risk does not warrant treatment	BAER work, storm inspection and future rehabilitation work should involve the consultation of forest archeologist before work commences. If sites are identified, work shall stop and consult with forest archeologist.
nonFSvalues	WA DNR lands within the burn perimeter	Increased runoff in ephemeral, intermittent and perennial streams and sediment depostion					

B. Emergency Treatment Objectives:

The primary objective of the Burned Area Emergency Response report is to recommend reasonable and necessary actions to protect, reduce and minimize threats to human life, safety, property, and to prevent unacceptable loss to cultural and natural resources on National Forest System lands from "imminent post-wildfire threats" (FSM 2523.02). The timely application of the proposed treatments is expected to substantially reduce the probability of damage to the BAER critical values identified in the section above. Recommended emergency treatment objectives include the following:

Protection and Safety Treatments

1. Implement physical road closures to protect the lives and safety of forest visitors and workers.
2. Installation of hazard warning signs at every entrance into the burned area to protect the life and safety of forest visitors and workers. Emphasize hazards and closure of roads to pedestrians as well as vehicles.

Property – Road Treatments

1. Protect road investments from potential infrastructure damage due to elevated runoff, erosion and deposition.
2. Reduce potential sediment delivery into the Hamma Hamma River degrading water quality and critical habitat for the salmon.
3. Inspect roads for damage and inspect bridges for debris jam build up and potential impacts to the life and safety of road users.

Land Treatments – Ecological Integrity

1. Reduce the potential for introduction/spread of invasive weeds by preventative seeding and monitoring of treatment effectiveness.

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

Land **90** % Channel ___ % Roads/Trails **95** % Protection/Safety **100** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land (invasives)	80	80	80
Channel	N/A	N/A	N/A
Roads/Trails	80	90	95
Protection/Safety	95	95	95

E. Cost of No-Action (Including Loss): **$750,000**

The market value cost to to reconstruct the road prism along the 2421, 2401 or 2480 road if failure occurs is between $5,000 to $50,000 per failure depending on the depth of road fill and extent of damage. There are 12 locations where road treatments were deemed necessary. If these locations resulted in failures due to no action the cost to reconstruct could be as much as $600,000.

Interim#1 – Elk Lake Trail #805
Replacement Cost: $126,720 @ $8/foot
Recent Elk Lake Trail Investment (2015-2018):
1080 hours - $27,140.40 investment over the last 4 years (@$25.43/hr)

F. Cost of Selected Alternative (Including Loss): **$88,226** - Assumes $58,226 for treatments and 95% chance of success for treatments.
Interim#1 - Storm Proofing Project Cost: $9645.51

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology	[**X**] Soils	[ ] Geology	[ ] Range	
[ ] Forestry	[**X**] Wildlife	[ ] Fire Mgmt.	[X] Engineering	[X] Trails/Recreation
[ ] Contracting	[ ] Ecology	[**X**] Botany	[ ] Archaeology	
[X] Fisheries	[ ] Research	[ ] Landscape Arch	[ ] GIS	

Team Leader: Dana Butler
Email: danabutler@fs.fed.us Phone: 360-956-2280 FAX: 360-956-2330

Dana Butler – Hydrology
Justin Urresti – Soils
John Laliberte – Engineering
Cheryl Bartlett – Botany
Nicole Lagioia – Recreation; Interim#1 – Meg Fluharty; Erica Keene
Marc McHenry - Fisheries
Betsy Howell – Wildlife

H. **Treatment Narrative:**
(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

Land Treatments: Items are in Blue Font for Interim#1

Proposed Actions to Address Risks to Natural Resource Critical Values

1) Seed trail corridors with a mix of locally sourced, genetically appropriate native species suitable for the site in order to prevent weeds from becoming established. Seed mixes will include (but are not limited to) species that establish quickly and complete well with weeds that are readily available such as California brome (*Bromus carinatus*), blue wild rye (*Elymus glaucus*), yarrow (*Achillea millefolium*), goldenrod (*Solidago canadensis*), fringecup (*Tellima grandiflora*), and large leaf avens (*Geum macrophyllum*). Seeding will occur either in fall or early spring of 2019.

Weeds prevention: Seeding		**Length**	**Approx. acres**
Trails:	Elk Lake, # 805	1.8 miles	4.3
	Jefferson Ridge, # 808	1.6 miles	3.8
Road:	2421, MP 2.6-5.3	2.7 miles	6.5
	Total:		**14.6 acres**

Costs of weeds prevention: Seeding and Effectiveness Monitoring			
GS 11 Botanist	3 days	Administration, coordination and implementation	$1,100
WCC crew	5 days	Implementation	$4,200
Supplies	N/A	Seeds	$3,650
GS 09 Invasive Plant Coordinator	1 day	Effectiveness Monitoring	$290
GS 05 Invasive Plant Tech	2 days	Effectiveness Monitoring	$300
GS 04 Invasive Plant Tech	2 days	Effectiveness Monitoring	$270
		Total:	**$9,810**

2) Monitor disturbance corridor managed by the Olympic NF inside the burn area not treated with preventative seeding in spring and early summer, 2019 to detect new occurrences of invasive plants. A 2 person crew can accomplish this work in two days at the following location:

Weeds monitoring		Length	Approx. acres
	2401, MP 3.2 - 6.2	3.0 miles	10.6
Total:			**10.6 acres**

Costs associated with these activities include:

Costs of weeds monitoring			
GS 09 Invasive Plant Program Coordinator	1 day	Administration and monitoring/treatment	$290
GS 05 Invasive Plant Tech	2 days	monitoring/treatment	$300
GS 04 Invasive Plant Tech	2 days	monitoring/treatment	$270
		Total:	**$860**

Interim#1 Lower Elk Lake Trail Critical Value Treatment

The trails in the burn area were not immediately evaluated post fire due to the hazard trees present in the burn area. The trails have now been evaluated and an unacceptable post-fire risk to trail infrastructure has been determined to exist on the Lower Elk Lake Trail #805 over 3 miles. The probability has been determined to be **Likely** and the magnitude of consequences is **Moderate**. Storm proofing will occur below high and moderate burn severity hillslopes. The risk matrix assessment is determined to be **High**.

In spring 2019 the burned area was deemed safe enough to evaluate the trails within the Maple Fire burned area. The hillslope is very steep and therefore hydrologic recovery and revegetation is expected to be slow and the threat to the Elk Lake trail persists. In areas of high/mod soil burn severity, unacceptable impacts to the Elk Lake trail include erosion of trail tread, damage to trail drainage features, sediment and debris deposition on trails affecting trail drainage and impacts to trail crossings. The BAER storm proofing treatments are designed to prevent future loss of trail infrastructure property that are susceptible to elevated post-fire runoff next fall/winter. The trail has been extensively maintained in recent years and there is concern of trail tread damage caused by increased overland flow and erosion. The recommended treatments are based on proximity to moderate and high burn severity areas, steep hill slopes, and the results of on-the-ground surveys.

To mitigate threats to property the WCC trail crew and volunteer crews will install trail erosion structures (hiker passable dips, log/rock drainage armoring, fill slope protection measures) to maintain natural drainage patterns and maintain trail stability during increased storm flows. This work will stabilize the FS trail tread property and reduce erosion caused by the loss of vegetation and root systems previously supporting the outer trail edge. Armoring key ephemeral drainages is done by placing rock in a rip-rap fashion below the trail in drainages to dissipate the energy of water flowing across the trail and prevent down slope head cutting and trail loss. In order to safely accomplish the trail drainage improvement sites, a level of hazard tree mitigation is needed. This hazard tree mitigation is limited to the trees that are determined to be at an imminent risk for failure. Additional hazard tree mitigation for ingress/egress of trail crews should be covered by forest funds.

Specific treatments recommended in Interim #1 are:
Storm proofing measures on 3 miles of the Elk Lake trail system: (1) improvement/armoring of approximately 20 ephemeral drainages to prevent head cutting and loss of trail tread; (2) installation of approximately 10 additional rolling dips; (3) fill slope protection where necessary. In addition to protecting the trail itself, these stabilization measures will also reduce detrimental effects to downstream values at risk.

Note: storm proofing treatments include cutting logs out as necessary by the Fire Crew to make the work sites accessible and free of hazard trees and to allow for safe crew egress in case of emergency.

ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	TOTAL
Project oversite: Erica Keene	3	days	$353.72	$1,061.16
Project Oversite: Meghan Fluharty	5	days	$316.87	$1,584.35
Hazard Tree	3	miles	$500	$1,500.00
WCC crew	1	week	$5,000	$5,000.00
supplies: gas, saw parts, tools, misc.	1	ea	$500	$500.00
TOTALS				$9,645.51

Storm Proofing Project Cost: $13,668.70
Replacement Cost: $126,720 @ $8/foot
Recent Elk Lake Trail Investment:
1080 hours - $27,140.40 investment over the last 4 years (@$25.43/ volunteer hour)

Activity in 2015, 2016, and 2017 consisted of a major rebuild of the entire trail (about 3.0 miles) from the trailhead on FS 2421 to the trailhead on FS 2401.

2018: Two days: 60 hours
2017: Three days: 90 hours
2016: Fifteen days: 450 hours
2015: Sixteen days: 480 hours

Roads and Trail Treatments:

The prescribed treatments for roads are designed to help preserve infrastructure while improving road surface drainage and providing redundancy to existing culverts to minimize damage caused by increased runoff and sediment transported from steep burned slopes above. Road treatments include: installing rolling dips and water bars to help handle increased flood flows and enlarging the area around culvert inlets.

The 2421 is at risk of losing road prism due to increased water and debris overwhelming road drainage structures. Before the road accesses the stable, convex ridge, the road passes through areas with moderate burn severity and pockets of high burn severity upslope. The treatments are only recommended within these moderate soil burn severity areas. The burned hillslopes above the road are very steep and every concave will likely transport elevated storm flows and transport staged material onto the road prism. Safety concern is to maintain critical road for access to radio repeater site.

The 2480 road with access to the 2401 road is a critical road for adjacent landowner administrative access. The WA DNR expects to salvage this winter with frequent timber haul on the 2401 road. A gate will be installed to allow for administrative access and easy closure while keeping the public and USFS staff safe. DNR will maintain the 2401, 2421 and 2480 roads through their property before, during and after salvage haul. These roads are cost share roads and the Olympic National Forest has jurisdiction on safety and environmental standards.

The 2480 road at the junction with the 2500 road provides critical administrative access to the 2421 radio repeater road and administrative access into the burned area that is not in conflict with the expected salvage sale. A gate is needed to allow for relatively easy administrative access on this mainline road while keeping the public out of the area and safe. The 2500 road is the access to Lena Lake trail area which sees hundreds of visitors on weekends even throughout the winter. The recreation area is north of the fire and north of the Hamma Hamma River along the 2500 road and is expected to open once closure gate and signage are in place. Road work on the 2401 will be above DNR land and their timber salvage haul route.

Road Number	Length	MTC lvl	Increase Culvert Basin size	Rolling Dips	Water Bars	Increase Culvert Inlet	Rolling Dip*	Water Bars	Totals
2480000	1.2	3	4	4		$240	$4,000	$0	$4,240
2401000	2.5	3	6	5		$360	$10,000	$0	$10,360
2421000	5.2	2	3		3	$180	$0	$750	$930
*different prices=different complexity					**Totals**	**$780**	**$14,000**	**$750**	**$15,530**

Costs of Engineering Contract Administration			
Engineer	8 days	Layout/Administration	$4,000

Road storm inspection and response is needed to inspect drainage features to evaluate debris deposition and drainage functionality post storm events. Treatments will include cleaning burnt debris and fallen rocks out of ditches and culvert inlets. Bridge storm inspections are needed to ensure that debris jams do not buildup against the auto bridge at Jefferson Creek. Jefferson Creek drains the burned area with the highest percentage of high and moderate soil burn severity. A hydrologist and/or bridge engineer will inspect the bridges after high flow events for one year following containment of the fire. If debris jams are

discovered, a recommendation will be made to remove the debris jams and prevent potential loss of the structures.

ITEM	UNIT	UNIT COST	NO. OF UNITS	TOTAL COST
Storm Inspection and Response	Days	$500	8	$4,000
3.6 miles of road (ditches); 60 culverts	CY	$20	200	$4,000
TOTAL				**$8,000**

Protection/Safety Treatments:

The prescribed treatments for emergency closure are designed to control access to mitigate risks to life and safety. The warning signs and gates are temporary in nature and will be removed when the risk is mitigated and the closure is revoked. These costs are for contract labor and have overhead built in.

There will be road closure warning signs and burned area hazard warning signs at each road closure. Additional signs will be installed at Highway 101 to inform forest users before they get close to the closure area. The warning signs, gates and barrier are temporary in nature and will be removed when the risk is mitigated and the closure order is revoked.

There will be two medium grade swing gates and one closure barrier installed. The swing gates need to be medium grade to maintain functionality and prevent damage to the gates. There will be a swing gate put in at the intersection of the 2480 and 25 Road to prevent access into the fire perimeter across the Hamma Hamma Bridge. This will allow for FS administrative access to the radio repeater road, storm patrol and other administrative use and land management within the fire perimeter.

There will be a swing gate at junction of the 2480 and 2401 roads to prevent access into the burned area while allowing the WA DNR frequent access for salvage logging and timber haul. There will be an ecoblock closure barrier installed on top of the ridge on the 2441 road to prevent access into the burned area.

Warning signs are needed to protect human life and safety of visitors to NFS lands along the Elk Lake and Jefferson Ridge Trails. Closure and warning signs will be placed at the trailheads to advise forest visitors of closures and hazards. The closure signs will be removed when the current closure order is lifted and warning signs will be left in place for 2-3 years.

ITEM	UNIT	UNIT COST	NO. OF UNITS	TOTAL COST
Area/Road Closure Signs	Each	$191.88	8	$1,535
Trail Area Warning Signs	Each	$243.35	4	$973
Installation	Hours	$130	4	$520
Closure Gates	Each	$6,675	2	$13,350
Closure Barrier	Each	$2,950	1	$2,950
TOTAL FOR CLOSURE TREATMENTS				**$19,328**

Costs of Engineering Contract Administration			
Engineer	3 days	Layout/Administration	$1,500

I. **Monitoring Narrative:** N/A – monitoring identified in storm inspection monitoring and invasives monitoring

Part VI – Emergency Stabilization Treatments and Source of Funds Interim #

			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										
Forest Botanist	Days	$366	3	$1,098	$0		$0		$0	$1,098
Invasive Plant Coord.	Days	$290	2	$580						$580
GS05 - Invasives Tech	Days	$150	4	$600						$600
GS04 - Invasives Tech	Days	$135	4	$540						$540
Supplies - Seed				$3,650						$3,650
WCC Crew	Days	$840	5	$4,200	$0		$0		$0	$4,200
Subtotal Land Treatments				$10,668	$0		$0		$0	$10,668
B. Channel Treatments										
Subtotal Channel (N/A)				$0	$0		$0		$0	$0
C. Road and Trails										
Interim#1 Trail drainage	Mile	$3,215	3	$9,646	$0		$0		$0	$9,646
Rolling Dips	Each	$1,000	4	$4,000	$0		$0		$0	$4,000
Rolling Dips (intense)	Each	$2,000	5	$10,000	$0		$0		$0	$10,000
Water Bars	Each	$250	3	$750	$0		$0		$0	$750
Increase Culvert Inlet	Each	$60	13	$780	$0		$0		$0	$780
Contract Admin	Days	$500	8	$4,000			$0		$0	
Storm Inspection	Days	$400	8	$3,200	$0		$0		$0	$3,200
Storm Response	CY	$20	200	$4,000	$0		$0		$0	$4,000
Subtotal Road & Trails				$36,376	$0		$0		$0	$36,376
D. Protection/Safety										
Closure Signs	Each	$192	8	$1,535	$0		$0		$0	$1,535
Trail Warning Signs	Each	$243	4	$973	$0		$0		$0	$973
Sign Installation	Each	$130	4	$520	$0		$0		$0	$520
Closure Gates	Eash	$6,675	2	$13,350	$0		$0		$0	$13,350
Closure Barrier	Each	$2,950	1	$2,950	$0		$0		$0	$2,950
Contract Admin	Days	$500	3	$1,500	$0		$0		$0	$1,500
Subtotal Safety				$20,828	$0		$0		$0	$20,828
E. BAER Evaluation										
				$8,891			$0		$0	$8,891
Subtotal Evaluation				—	$8,891		$0		$0	$8,891
F. Monitoring										
Subtotal Monitoring (N/A)				$0	$0		$0		$0	$0
G. Totals				$67,872	$8,891		$0		$0	$76,763
Previously approved				$58,226						
Total for Interim1 request				$9,646						

PART VII - APPROVALS

5/15/2019

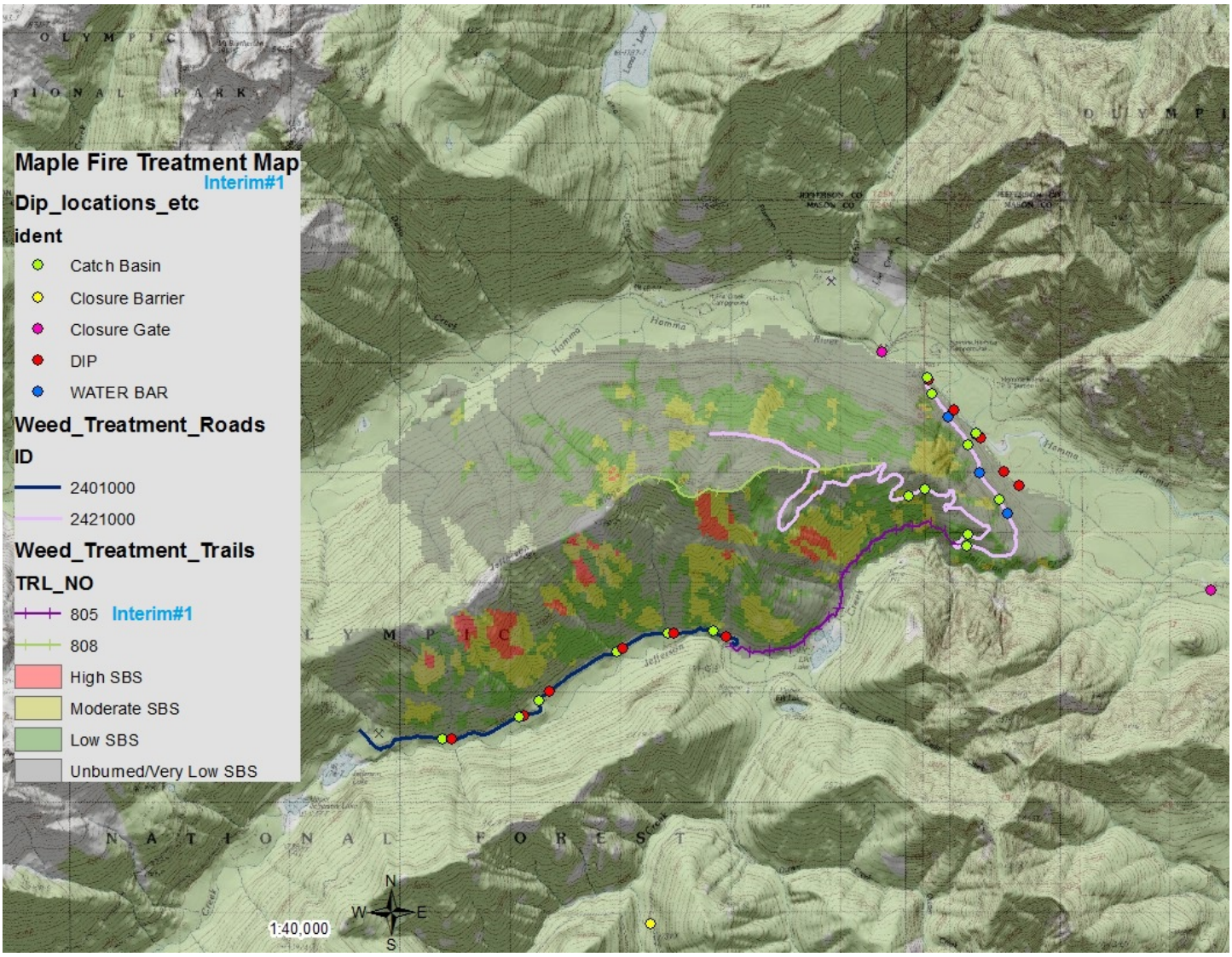
X Reta Laford

Reta Laford
Forest Supervisor
Signed by: RETA LAFORD

1. _____ _____
Forest Supervisor (signature) Date

2. _____ 3 Jun 19
Regional Forester (signature) Date

Maple Fire – Interim#1 Map – ~~Elk Lake~~ Trail #805


Maple Fire Treatment Map
Interim#1
Dip_locations_etc
ident
Catch Basin
Closure Barrier
Closure Gate
DIP
WATER BAR
Weed_Treatment_Roads
ID
2401000
2421000
Weed_Treatment_Trails
TRL_NO
805 Interim#1
808
High SBS
Moderate SBS
Low SBS
Unburned/Very Low SBS
N
W
E
S
1:40,000