

Date of Initial Request: September 30th, 2013

1st Ammended Request (post-furlough): October 21<sup>st</sup>, 20132nd Ammended Request (following spring): May 23<sup>rd</sup>, 2014**BURNED-AREA REPORT**  
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST****A. Type of Report**

- ☒ 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)  
☒ 2. Interim Report #2  
☒ 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:** Government Flats Complex      **B. Fire Number:** OR-MHF-000697  
**C. State:** OR      **D. County:** Hood River and Wasco Counties  
**E. Region:** 6      **F. Forest:** Mt. Hood National Forest.  
**G. District:** Barlow and Hood River      **H. Fire Incident Job Code:** H6HV1Q 0606 (P)  
**I. Date Fire Started:** 8-16-2013      **J. Date Fire Contained:** 9-9-13  
**K. Suppression Cost** (as of 9/20/2013): Total Fire: \$ 14,237,743, FS Contribution: \$ 2,238,645  
**L. Fire Suppression Damages Repaired\* with Suppression Funds**  
1. Fireline waterbarred (miles):      Dozerline 11.5 miles Handline 7.0 miles  
2. Fireline repaired (miles):      Dozerline 7.0 miles Handline 3.8 miles  
3. Fireline seeded (miles):  
4. Other (identify):

\*Note: some suppression repair of fireline has yet to be completed

**M. Watershed Number(s):** 170701050403 (North and South Forks Mill Ck)  
170701050402 (Three Mile)  
170701051102 (Mosier)

**N. Total Acres Burned:** 11,354 (9/6/13) See the Fire Vicinity and Fire Incident maps.

NFS Acres (2,232) Other Federal (1,446) State (7) City (2,603) Private Industrial (3,241 )  
Other Private (1,825)

**O. Vegetation Types:** Grass and oak hardwoods occur on lower south-facing slopes and eastern uplands. Conifer stringers of pine and fir are common in drainageways and north-facing slopes. Mixed conifer occurs at upper most elevations, including stands where a heavy dead and downed component is common.

**P. Dominant Soils on NFS lands within the Fire Perimeter:**

Soils in the Mill Creek and Mosier watersheds were mapped by the 1979 Soil Resource Inventory of the Mt. Hood National Forest (SRI). Mount Hood SRI Soil Map Units (SMUs) 158, 162, and 163 are dominant soil mapping units within the steep, moderate to high burn severity areas in North Fork Mill Creek.

The soils in the area are in the Frigid soil temperature regime and have Moderate or Moderate to Severe potentials for surface runoff as a result of rainfall in excess of the soils infiltration capacity. Forest floor is covered with a 0 to 2 inches of decomposing needles or leaves and twigs from Ponderosa Pine, Douglas-fir, and oak.

Paul Shields and Loren D. Herman in 1970 considered soils in The Dalles Watershed to range from very shallow, slightly plastic cobbly loams to moderately deep, slightly plastic, greyish loamy fine sands, well drained, of moderately rapid permeableness and have weak surface stability (Hall 1972).

**Major Soil Map Units - Distribution by Acres and Selected Attributes**

SRI_CODE	Slope Modifier	Acres	Surface Erosion Potential	Rate of Surface Runoff	Water Yield Class*
153	Gentle	2	Slight to moderate	Moderate	II
154	Steep	32	Moderate	Moderate	II
158	Varies	223	Moderate to severe	Moderate	II
162	Steep	185	Moderate	Moderate	II
163	Steep	756	Moderate	Moderate	II
347	Gentle	520	Slight	Moderate	II
348	Steep	50	Moderate	Moderate	II
349	Gentle	40	Moderate	Moderate	II
153-8	Gentle	14	153-Slight to moderate 8-Slight	Moderate	II
158-3	Varies	358	158-Moderate to severe, 3-slight	Moderate/Low	II
162-8	Varies	65	162-Moderate, 8-Slight to moderate	Moderate	II

\*Note: Water Yield Class II soils have moderate water detention storage capacity and a moderate rate of runoff. Water contributes to both base and peak flows.

**Q. Geologic Types on NFS lands within the fire perimeter:**

North Fork and South Fork of Mill Creek watersheds are underlain with bedrock of Columbia River Basalt flows, more specifically, Grande Ronde Basalt and Wanapum Basalt formations. These flows in Mosier Creek watershed to the north are overlain by volcaniclastic layers of the Dalles Formation.

Steep valley walls of Mill Creek are susceptible to debris slides, and deep bedrock landslides. Geologic landslide risk mapping rates as either “High” or “Moderate” in most of North Fork Mill Creek watershed, based on landslide risk ratings from Forest-wide landform mapping. Mill Creek Watershed Analysis noted slopes in North Fork Mill Creek valley contains coarse-grained debris flow deposits in severely dissected channels with “very short runout zones, even after the narrowness of their respective valleys is taken into consideration.” Beaulieu (1977) discusses potential for future mass movement with changes in land use as highest in

- faults in the Columbia River Basalt,
- moderate to steeply sloping, or gently dipping, slopes of the Dalles Formation, in areas of increased infiltration,
- steep slopes of unconsolidated material
- steep slopes in devegetated areas.

**R. Miles of Stream Channels by Order or Class on NFS lands within the fire perimeter:**

Perennial: 5.0, Intermittent: 5.9

**S. Transportation System on NFS lands within the fire perimeter:**

Trails: 0.0 miles      Roads: 6.2 miles

### **PART III - WATERSHED CONDITION**

**A. Burn Severity (acres\*):** Low = 609 (27%) Moderate 642 (29%) High 669 (30%)

\*Note: These are only the acres of Forest Service (FS) lands within the fire perimeter. Values do not include non-FS lands.

#### **Moderate to High Severity Burn**

Field reconnaissance was conducted to validate the burn severity classifications indicated by the BARC map. Observations indicated that the mapping over-estimated the extent of the high severity classification. Adjustments were made to the map in an attempt to enhance its accuracy. While the adjustments to the mapping were favorable, conditions observed in the field suggested that the extent of the high severity classification that was depicted by the BARC map was still greater than what was on the ground. This was attributed to the character of the fire behavior.

Being wind driven, the fire on FS lands burned quickly and moved through the canopy fast over a single burning period. Duration and severity of heating at the soil surface was not prolonged except where there were large downed logs in contact with the ground, in stumps, or where there were large slash piles. This led to the conclusion that, where the BARC map depicted high burn severity, on the ground it was much less extensive and frequent, individual locations were scattered about. Further adjustments to the map however were not made, because a principle feature of the moderate to high classification that is different than the moderate class is that effective ground cover and living vegetation was completely denuded. Overstory and shrub mortality was complete so that the potential for needle-cast to contribute to the recruitment of effective ground cover was very low. Thus the team felt that the map's depiction of the extent of the high severity classification represented well where the greatest effect to soil resources from this fire occurred, and where heightened runoff would be expected to be greatest. But since the majority of this delineation is actually moderate severity the team decided to merely change its classification to a mixed connotation, likened to a soil complex type of map unit.

It is estimated that about 30 percent of the Government Flats fire on FS lands is considered to be classified as moderate to high severity. Combustion of the litter and humus layers on the soil surface was complete. Several inches of grayish-white ash cover the ground. Fine roots were consumed within the top ½ to 1 inch below the soil surface, but below that they were wholly intact. Soil color and structure was not altered to depth except in some places a thin layer at the surface, or as mentioned where large fuels in contact with the ground burned for a prolonged period of time. See the Soil Burn Severity map.



Examples of moderate to high severity in the foreground of each of these photos

### **Moderate Severity Burn**

Approximately 29 percent of the fire is determined to be in the moderate burn severity classification. In the Government Flats Complex fire this class represents a broad range of burn characteristics. Much of the moderate severity burn was on the high end of the moderate severity class. The litter was consumed or mostly so, but the humus and fine roots near the surface were only partially consumed. Or the humus was mostly consumed but the fine roots at the surface were barely charred. Grayish to black ash covered the ground. Soil color and structure was not altered at the surface or at depth. Overstory tree and shrub mortality was often greater than 50%, but needle-cast has been covering the ground since burning has ceased.

### **Unburned and Low Severity Burn**

This combined classification extends across about 27 percent of the fire on FS lands. The litter layer has been charred black or is partially consumed where low severity burning occurred, and in places the humus layer was too. Both were recognizable and still providing a measure of effective ground cover. Fine roots near the surface were not affected by soil heating. Overstory and shrub mortality is very low. Trees, shrubs, and grasses may be scorched or partially consumed. The portion within the fire perimeter that did not burn amounted to the remaining 14 percent of its area.

**B. Water-Repellent Soil (acres):** Resistance to wetting is naturally intrinsic to all of the soils within the fire perimeter on FS lands. Within the A-horizon, the first inch is not resistant to wetting, but below that repellency is observable in the next 2 to 3 inches. The soil at that depth could be characterized as being slightly to moderately hydrophobic, and water beaded on the surface for 30 to 45 seconds. The condition however is not believed to be induced by fire. Volcanic ash that is mixed in with the topsoil is repellent to wetting when totally dry due to its low capillary potential. Once wetted however, repellency diminishes markedly and infiltration rates are high.

### **C. Soil Erosion Hazard Rating (FS acres):**

520 (low)   1,143 (moderate)   581 (high)

### **D. Erosion Potential: 2.8 tons/acre\* (ERMiT)**

\*Note: This value is low and would seem to suggest that there would not be a need for erosion control. But several factors are not considered in the ERMiT model runs that would suggest that actual values are greater than this estimate. Surface soils within the fire have a fine volcanic ash component that has very low bulk density, very weak soil structure, and high particle detachability potential. Terrain is another factor. Headwater convergence zones of the steep draws represent a different terrain than modeled by ERMiT, and a different type of hillslope shape. Flow routes in the catchment area converge toward the center of the draw where it then becomes concentrated. This type of erosive energy is considered to be greater than that of parallel flow routes in a modeled setting. Supporting this notion were preliminary estimates by the NRCS for the portions of the fire they are addressing and their estimates ranged between 6 and 11 tons/ac. Thus it is felt that the actual erosion potential is at least 2 to 3 times greater than the value estimated by the ERMiT model. See the photo below for an example of runoff in one of the headwater convergence zones after a light (2/10"), moderate-duration rain (4 hrs).

### **E. Sediment Potential: 1,027 cubic yards / square mile (ERMiT)**



Water accumulation after a light rain in one of the steep draws where burn severity was moderate to high.

## **PART IV - HYDROLOGIC DESIGN FACTORS**

**A. Estimated Vegetative Recovery Period, (years):** 10

**B. Design Chance of Success, (percent):** 95

**C. Equivalent Design Recurrence Interval, (years):** 10

**D. Design Storm Duration, (hours):** 24

Note: A search of information regarding historical floods revealed that the largest and most damaging that have been recorded, and that impacted Mill Creek were associated with 24-hour events such as the 1964 and 1996 floods. These types of events were recorded as prolonged, intense precipitation, whereas high runoff events on record that were connected to convective thunderstorms resulted in notably less effect.

**E. Design Storm Magnitude, (inches):** 3.43

**F. Design Flow, (cubic feet / second/ square mile)<sup>2</sup>:** North Fork Mill Creek – 60.3, Mosier Creek – 112.7  
South Fork Mill – 97.6

**G. Estimated Reduction in Infiltration, (percent):** 10 year event: ~1% (see soils section on hydrophobicity)

**H. Adjusted Design Flow, (cfs per square mile)<sup>3</sup>:** North Fork Mill Creek – 83.8, Mosier Creek – 140.9  
South Fork Mill – 124.0

### **Hydrologic Peak Flow Estimates by Subwatershed**

Subwatershed	Area (acres)	Peakflow (OWRD)	Confidence Limits	FireHydro Pre	FireHydro Post	FireHydro Post with Bulking	Kuyumjian (15% Bulking)	Kuyumjian (25% Bulking)	% Increase FireHydro	% Increase Kuyumjian (15%)	% Increase Kuyumjian (25%)
North Fork Mill	4142	390	182 to 835	419	549	582	532	545	39%	36%	40%
Mosier	1391	245	113 to 531	142	171	178	287	290.6	25%	17%	19%
S Fork Mill	417	63.6	28 to 145	58	70	73.5	71.4	72.1	27%	12%	13%

<sup>1</sup>. These are preliminary erosion and sediment figures that may be modified based on sediment yield estimates that are being computed using NetMap but not yet available for the 2500-8.

<sup>2</sup>. Initial peak streamflows were from the Oregon Water Resources Departments Auto Delineation Program that calculates peak discharge using the prediction equation for East Side Watersheds - North Central

<sup>3</sup>. Adjusted design flows were calculated by increasing the initial peak streamflows by the percentage that peak streamflows were increased using FireHydro (Cerreli 2005)

## **PART V - SUMMARY OF ANALYSIS**

### **A. Describe Critical Values/Resources and Threats**

The BAER team evaluated the risk level to each identified critical value using the matrix below. Local agency resource specialists were consulted to identify and help evaluate the relative risk. The estimated risk to downstream critical values is based on the assumption of the design storm, a 10 year, 24 hour rainfall event (as estimated by the ERMiT Model) of at least 3.43 inches of rainfall, occurs sometime within a 12 month period following containment of the fire.

Values at risk were identified primarily for those that occur on Forest Service lands. It is important to note however that there are some very important values at risk that are on non-forest lands that are downstream. Treatments on FS lands would indirectly be a benefit to those values. They include private rural residences and property, infrastructure and facilities of the city of The Dalles, urban residences and property, and a municipal water treatment plant. All of these off-Forest values could be at risk of accelerated erosion and sedimentation, and flash floods. Since these values are not on FS lands they are not eligible for BAER treatments, but those that are on FS lands are described in more detail in the following discussion.

<b>Magnitude of Consequences on Probability of Damage or Loss</b>			
<b>Probability of Damage or Loss</b>	<b>Magnitude of Consequences</b>		
	Major	Moderate	Minor
	<ul style="list-style-type: none"><li>• Loss of life or injury to humans</li><li>• Substantial property damage</li><li>• Irreversible damage to critical natural or cultural resources</li></ul>	<ul style="list-style-type: none"><li>• Injury or illness to humans</li><li>• Moderate property damage</li><li>• Damage to critical natural or cultural resources resulting in considerable or long term effects</li></ul>	<ul style="list-style-type: none"><li>• Property damage is limited in economic value and/or to few investments</li><li>• Damage to natural or cultural resources resulting in minimal, recoverable or localized effects</li></ul>
	<b>RISK</b>		
Very Likely (>90%)	<b>Very High</b>	<b>Very High</b>	<b>Low</b>
Likely (>50% to <90%)	<b>Very High</b>	<b>High</b>	<b>Low</b>
Possible (>10% to <50%)	<b>High</b>	<b>Intermediate</b>	<b>Low</b>
Unlikely (<10%)	<b>Intermediate</b>	<b>Low</b>	<b>Very Low</b>

The Very High and High Risk are unacceptable risk levels due to threats to human life, property, infrastructure and resources, therefore treatments should be applied. An Intermediate Risk could be unacceptable if human life or safety is the critical value at risk.



## Human Life and Safety

### Magnitude and Probability of Consequences for Human Life and Safety Values

HUMAN LIFE & SAFETY Value at Risk	Risk	Probability of Damage or Loss	Magnitude of Consequences
<b>Personal injury from Hazard Trees:</b> 1711-630 (Slobber Dr.): MP 0.3-1.9 1711-000: MP 2.0-3.0 1711-650: MP 0.0-0.3	High	Possible	Major
<b>Personal injury from Hazard Trees:</b> General burn area	Intermediate	Unlikely	Major
<b>Debris flows, severe storm event/ road fill failure:</b> Slobber Drive (Rd. 1711-630): MP 0.3-1.8	Intermediate	Unlikely	Major

#### Roads

A segment of the 1711-630 road (Slobber Drive), is located on steep and potentially unstable slopes and where burn severity was moderate to high. It is at risk of accelerated erosion or exacerbated instability should a heavy precipitation or high runoff event occur as a result of an intense storm event. Anyone using the road segment during or immediately after a storm could be at risk of being harmed, stranded or worse should a washout or slide occur.

#### Hazard Trees

The segment of the Slobber road located where burn severity was high had older forest structure along its alignment, with lots of large and medium sized trees, of which all were killed by the fire. Many old snags were also burned and are still standing. These present a clear safety hazard for those who will conduct emergency rehabilitation work on that road segment. Those that are directly within reach of work locations would need to be removed prior to work.

Additionally, there are hazard trees along nearly all of the other road segments within the fire. The hazard where burn severity was moderate to high is of particular concern. These segments represent a clear danger should a tree fall when someone is nearby. Hence, until these hazards are removed roads should be closed to access to the general public.



## Property

### Magnitude and Probability of Consequences for Property

PROPERTY Value at Risk	Risk	Probability of Damage or Loss	Magnitude of Consequences
Road: 1711-630 (Slobber Dr.), MP 0.3-1.9	Very High	Likely	Major
Bridge: Rd. 1720-190, S Fork Mill Cr. (USFS manages road on Hood River County land)	Low	Unlikely	Moderate
Cross drain culvert: Rd. 1711-630	Low	Likely	Minor
Cross drain culverts: Rd. 1711 Rd. 1711-650	Low	Possible	Minor
Stream Crossing/AOP (Aquatic Organism Passage structure): Rd. 1700-660	Very Low	Unlikely	Minor
Cross drain culverts: Rd. 1720-191	Very Low	Unlikely	Minor
Stream Crossing: Rd. 1711-630 Slobber Dr. at North Fork Mill Cr.	Very Low	Unlikely	Minor
Water development (range improvement, Long Prairie Allotment): "John's Spring" T1S, R11E, SEC 7 NWSE	Low	Very Likely	Minor
The Dalles Municipal Watershed Infrastructure (NFS lands)	Very Low	Unlikely	Minor
Trail #451	Very Low	Unlikely	Minor

#### Municipal Watershed

The City of The Dalles Municipal Watershed was identified as a municipal watershed before the establishment of the Mt. Hood National Forest. The municipal watershed consists of approximately 25,500 acres that is mostly on National Forest land. The objective to manage this area to maintain high quality drinking water was formalized between the City of The Dalles and the United States Department of Agriculture (USDA) in a 1912 cooperative agreement. This agreement was completed "for the purpose of conserving and protecting the water supply of Dalles City, Oregon". Since the initial agreement between the City of The Dalles and USDA, further direction has been issued through the 1972 document entitled "Comprehensive Management Plan – The Dalles Municipal Watershed" and the 1972 Memorandum of Understanding (MOU) between The Dalles and US Forest Service. Therefore, the watershed is managed jointly by the Forest Service and the City, according to a Memorandum of Understanding (MOU) and a subsequent Comprehensive Management Plan (December, 1972). The basic objective for managing this watershed is to maintain or restore the present quality and quantity of water received from the major sub-drainages. Also, it is emphasized in the MOU that water quality will take priority over water quantity in management decisions. There are 183 acres of The Dalles Watershed within the fire perimeter on National Forest System Lands. Within this portion of the watershed there are 21 acres of high severity soil burn severity and 31 acres of moderate soil burn severity.

The largest threat to water quality is increased turbidity and sedimentation resulting from primary hillslope erosion and secondary sediment introduction by channel bed and bank erosion. It is estimated from the high severity soil burn severity area on National Forest System Lands that there is the potential for 0.6 tons per acre sediment delivery associated with a 10 year event and a ~25% increase in the 10 year peak streamflow event at approximately the National Forest Boundary which is ~8.6 miles upstream from the water system intake.

### Range

A water development (range improvement) burned in Long Prairie Allotment: "John's Spring" (T1S, R11E, Section 7 NWSE). Structures involved include a water trough with hardware, a headbox (spring collection device), black poly pipe, and likely wooden railroad ties, with some wood posts around trough to prevent movement.

### Roads

Structural stability of Forest Road 1711-630 (Slobber Drive) from MP 0.3-1.9 is at Very High risk of likely substantial erosion damage. Outside of the Very High risk road segment of Slobber Drive, there is a single culvert at the north end (Mosier Cr.) at Low risk. And the North Fork Mill Creek crossing at the south end of Slobber Dr. (a 72" multi-plate culvert) is at Very Low risk. A bridge on Forest Road 1720-190 is downhill of the portion of the fire that burned in South Fork Mill Creek. It crosses over the lowest reach of a small ephemeral tributary outside of the burned over area. There is an approximately 21-acre patch about a mile above the bridge near the top of the ridge, and at the very head of the ephemeral tributary where the burn severity is high. Because of its small size, the ephemeral characteristic of the tributary, and the position of the burned patch high above the bridge, it is believed that the risk for erosion or peak flows to damage the bridge is Low. The risk is also considered to be Very Low to the road drainage culverts and stream crossing structures under the following roads: 1711, 1711-650, 1700-660, and 1720-191 because the terrain is gentle and they are in the far upper reaches of their respective drainage.

### Trails

Trail #451 is outside of the burned over area, and so it is at Very Low risk of any fire-related damage. It is not considered to be a value at risk despite its close proximity.

## Natural Resources

### Magnitude and Probability of Consequences for Natural Resources

NATURAL RESOURCES Value at Risk	Risk	Probability of Damage or Loss	Magnitude of Consequences
<b>Non-Weedy Special Habitat:</b> Mill Cr. Ridge Native bunch grass meadows	Very High	<i>Likely (&gt;50% to &lt;90%)</i>	<b>Major</b>
<b>NSO Critical Habitat:</b> High severity burn	Very High	<b>Very Likely (&gt;90%)</b>	<b>Major</b>
<b>NSO Suitable Occupied Habitat:</b> High severity burn	Very High	<b>Very Likely (&gt;90%)</b>	<b>Major</b>
<b>Steelhead Critical Habitat:</b> N. Fork Mill Cr.	Very High	<b>Very Likely (&gt;90%)</b>	<i>Moderate</i>
<b>Steelhead Suitable Occupied Habitat:</b> N Fork Mill Cr.	Very High	<b>Very Likely (&gt;90%)</b>	<i>Moderate</i>
<b>Non-Weedy Riparian Native Plant Community:</b> N Fork Mill Cr. drainages (High Severity Burn; T.1S-R.11E-Sec. 8, N 1/2 )	Intermediate	Possible (>10% to <50%)	<i>Moderate</i>
<b>Soil Productivity:</b> steep slopes & draws (slope stability; mass wasting)	Intermediate	Possible (>10% to <50%)	<i>Moderate</i>
<b>Water Quality (NFS lands):</b> The Dalles Municipal Watershed	Intermediate	Possible (>10% to <50%)	<i>Moderate</i>
<b>Non-Weedy Riparian Native Plant Community:</b> Mosier Cr. drainage (N of Rd. 1711, T.1S-R.11E-Sec 6, SE1/4)	Low	Unlikely (<10%)	<i>Moderate</i>
<b>NSO Critical Habitat:</b> Moderate-Low severity burn (i.e. remaining)	Low	<i>Likely (&gt;50% to &lt;90%)</i>	Minor
<b>NSO Suitable Occupied Habitat:</b> Moderate-Low severity burn (i.e. remaining)	Low	<i>Likely (&gt;50% to &lt;90%)</i>	Minor
<b>Soil Productivity:</b> lower gradient slopes	Low	Unlikely (<10%)	<i>Moderate</i>
<b>Non-Weedy Special Habitat:</b> Aspen stand near Rd. 1711/Mosier Cr. headwaters	Very Low	Unlikely (<10%)	Minor

## Fisheries

Only one fish species listed as Federally Threatened or Endangered is known<sup>5</sup> to be present in streams within the fire area on National Forest System Lands. Middle Columbia River Evolutionary Significant Unit (ESU) steelhead trout (*Oncorhynchus mykiss*), listed as a threatened species, is found within North Fork Mill Creek. The Oregon Dept. of Fish and Wildlife (ODFW) considers the reach in N. Fk. Mill on NFS lands as the best habitat in the greater Mill Ck watershed, and has suggested that the wild steelhead populations there to be one of the most important of the tributaries in Oregon of the east Columbia River. This population is already considered beleaguered as a result of urban and rural residences and agriculture that has severely encroached upon their habitat along the main stem of greater Mill Ck. Cutthroat trout (*O. clarki*), likely the coastal variety, and resident rainbow trout (*O. mykiss*), both Management Indicator Species (MIS) in the Mt. Hood National Forest Land and Resource Management Plan (LRMP), are present in North Fork Mill Creek within the fire area on National Forest System Lands. The resident rainbow trout in North Fork Mill Creek are suspected to be the redband subspecies, which is a Regional Forester's Special Status species.

Stream surveys indicate that the presence of fine sediment exceeds LRMP S&Gs, and that the presence of high quality pools is considered to be relatively low. Wildfire induced accelerated erosion could be expected to further degrade the habitat. In particular, spawning gravels could become more embedded from an increase of fine sediment because the stream's average annual discharge is fairly low. Peak flows would be expected to be capable of transporting sediment, but now there is potential for accelerated erosion from runoff to deposit in the stream during base flows or when there are non-peak events. Increases in sedimentation and embeddedness to spawning gravels could affect the local population by reducing spawning success and fry survival, and further diminish the abundance of quality pools for returning adults to rest for spawning. The risk of potential negative effects to the local population is thought to be high because the magnitude would be considerable and long-term.

Miles of steelhead critical habitat – 2.6

Miles of known steelhead presence - 3.35

<sup>5</sup> The terms "known" and "suspected" are used to describe fish and other aquatic fauna distribution in this document. Known presence describes areas where a species has been documented. Areas of known presence could also be defined as occupied habitat. Suspected presence describes areas where a species has not been documented, but fisheries biologists believe they are present.

## Invasive Plants

Nonnative invasive plants – e.g. Ventenata grass (*Ventenata dubia*), cheatgrass (*Bromus tectorum*), knapweeds (*Centaurea* spp.), and Bull thistle (*Cirsium vulgare*) – threaten critical native plant communities in the parts of the burn area. Native bunchgrass meadows characterize the top of Mill Creek Ridge, where invasive weeds were relatively absent or in low abundance prior to the burn. These special habitats are at Very High risk of ecosystem-altering weed invasion, since undesirable nonnative invasive species occur lower in the watershed and Mill Cr. Ridge Lookout Road is a potential weed conduit. Ventenata grass is an aggressively spreading annual that once established, dominates and replaces native perennial bunch grasses. This species is especially difficult to control mechanically and chemically.

The riparian native plant communities in the burn area also had relatively few weeds prior to the fire. These riparian habitats and an aspen stand (Mosier Cr. headwaters) are less susceptible to the targeted upland invasive weed species than the ridge top meadows on Mill Cr. Ridge. Since portions of North Fork Mill Cr. riparian ecosystems burned severely, those drainages face an Intermediate risk from target invasive weeds. The Mosier Cr. drainages and the aspen stand near Rd. 1711 experienced low and moderate severity burn, so those native plant communities are at Low and Very Low invasive weed risk.

## Soils

Open grassland areas supported by SMU 158 and 8, and the steep Ponderosa Pine and Oregon White Oak stands supported by SMU 154 are considered relatively low in resilience to intense burning and management actions, as well as relatively low in soil productivity. Most soils in the North Fork Mill Creek drainage portion of the fire, specifically SMU 162 and 163, are relatively “moderate” in soil resilience and soil productivity. Mosier Creek area, mostly mapped as SMU 347, rates as relatively “high” in soil resilience and productivity. The Dalles watershed portion (i.e. S. Fk. Mill Ck.) of the fire on National Forest lands has a mix of low and moderate burn severity.

Surface soils of SMUs 162 and 163 in North Fork Mill Creek drainage range from dark yellowish brown to dark grayish brown, and are soft, very friable, non-sticky, non-plastic, loams with weak, very fine, granular or subangular blocky structure, and 20 to 35 percent coarse fragments. These soils formed in loess and volcanic ash deposits over steep slopes of The Dalles geologic formation. Steep slopes of these soil types are at the greatest risk of wildfire induced accelerated erosion. The clay fraction of the loam has been observed to stay in suspension for comparatively prolonged time as observed in tests to evaluate settling rates, turbidity, and particle-size distribution conducted in the early 1970s by water treatment operators (anecdotal D. Anderson, city of The Dalles public works). Erosion rates on these soils is estimated to potentially be between 5.6 and 6.4 tons/acre where burn severity was high, which is approximately 2/3 of these soil types. They are distributed directly above the main stem of N. Fk. Mill Ck and are moderately dissected by steep narrow ephemeral or dry draws.

Relatively few acres of high or moderate soil burn severity occurred in the Mosier Creek watershed. Mostly SMUs 347, 348, and 349, these soils are dark brown to brown gravelly loams, 7 to 13 inches thick, formed in glacial till with some volcanic ash.

Gentler slopes of SMUs 347 and 348 in the Mosier Creek drainage displayed Moderate to High burn severity, but are outside areas identified for BAER treatment. The more open areas of SMU 158 vary in topography and are primarily used for grazing.

#### Wildlife

For Federally Threatened Northern Spotted Owl (NSO), approximately 95% of entire burn area on NFS land is Critical Habitat; only the southeast corner of the burn area in The Dalles Municipal Watershed is outside NSO Critical Habitat. Portions of NSO Critical Habitat and occupied suitable habitat burned at high severity, including the majority of one 100-ac. LSR and portions of another 100-ac. LSR. These critical habitat values are at Very High risk of major loss. Where NSO Critical Habitat and occupied suitable habitat burned at low to moderate severity, the risk is acceptably low. Rehabilitating and restoring forest structure of lost NSO Critical Habitat and formerly occupied suitable habitat are outside the scope of BAER emergency stabilization treatments. Reforestation needs should be consider for non-BAER post-fire rehabilitation and restoration programs.

## Cultural and Heritage Resources

**Magnitude and Probability of Consequences for Cultural and Heritage Resources**

<b>CULTURAL &amp; HERITAGE RESOURCES Value at Risk</b>	<b>Risk</b>	<b>Probability of Damage or Loss</b>	<b>Magnitude of Consequences</b>
Slobber Drive (Rd. 1711-630)	High	Possible	Major
666IS154; Carved aspen trees	Low	Possible	Minor
666IS212; prehistoric artifacts	Low	Possible	Minor
666MC211; Houseplace remains, prehistoric artifacts	Low	Possible	Minor
666MC213; Houseplace remains, prehistoric artifacts	Low	Possible	Minor
666NA198; prehistoric artifacts	Low	Possible	Minor
666NA205; prehistoric artifacts	Low	Possible	Minor

661EA340; North Section Line Trail	Very Low	Unlikely	Minor
666IS209; prehistoric artifacts	Very Low	Unlikely	Minor

#### Artifacts and House Remains

All artifacts and houseplace remains values at risk have minor loss consequences and Low to Very Low risk of damage or loss. Combustible artifacts may have burned and prehistoric artifacts may be unsuitable for hydration dating in the heritage resource sites listed in the table above. Site #666IS209 had only quartz artifacts, which are unlikely to have been damaged. Carved aspen trees are unlikely to have burned (moderate burn severity on moist ground). Blazed trees marking the North Section Line Trail are unlikely to have burned.

#### Roads

Slobber Drive (Rd. 1711-630) has not been formally evaluated National Register of Historic Places listing, so it is considered potentially eligible for the NRHP. This road dates back to the late 1800s. Road alignment was unaffected by the fire and there are no wooden drainage structures on the road (see PROPERTY). So damage to the historic value of the Slobber Drive is slightly possible, and the risk is considered high.

## B. Emergency Treatment Objectives:

Diminish the risk of threats to human life and safety posed by hazard trees immediately adjacent to work zones where BAER activities would occur to protect a potentially eligible historic road segment from accelerated erosion on steep slopes.

To minimize post-wildfire accelerated erosion on steep slopes (i.e. 30-60%) where burn severity was high and indirect effects of heightened runoff would likely result in unwanted effects to critical fish habitat, water quality, soil productivity, and municipal water supplies.

Limit the potential for invasive weed spread in native bunchgrass meadows that were burned over and that are bisected by or adjacent to roads.

See the values at risk tables in the proceeding Section V.A., the Land Allocations map, and the Designated Critical Habitat map.

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

Land 65 % Channel NA % Roads 80 % Protection/Safety 85 %

\*Note: Assuming first damaging storm is a 2 year, 24 hour storm event.

## D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	70	80	90
Channel	NA	NA	NA
Roads	85	90	95
Protection/Safety	90	95	95

## E. Cost of No-Action (Including Loss): \$ 1,300,000

### Justification for no-action cost estimate

If none of the treatments were implemented, the risk to certain critical values could be high. The cost of not conducting treatments could potentially be as high as 1.3 million dollars over the next 40 years. While this estimate is coarse, the cost of repairing a catastrophic failure of the Slobber Road, of detecting, eradicating, and treating invasive weeds, the cost of lost tree growth attributable to erosion, the potential cost of compromised human safety, and the reduction in revenue due to diminished steelhead production could collectively be expensive.

**Human Life and Safety:** Hazard trees would not be removed along specific locations where waterbars would be constructed on a 1.4 mile segment of the 1711-130 road (Slobber road). A road closure to the general public would not occur, so people could be endangered by hazard trees.

**Property:** The Slobber road would be at high risk of catastrophic failure. Its potential historic eligibility would be compromised. The access it provides would be truncated. Sediment delivery to designated critical

steelhead habitat where, according to stream surveys the presence of fine sediment is already believed to be above LRMP S&Gs would be further impacted and water quality diminished.

**Natural Resources:** The spread of non-native invasive plants and noxious weeds would not be curtailed in the burned over native bunchgrass meadows. The diverse assemblage of native plants and special habitat values would be diminished if aggressive and persistent ventenata grass and cheatgrass dominate these sites. On steep slopes, accelerated erosion on specific headwater confluence zones could occur unabated for several years until an effective ground cover re-established, further affecting FWS designated critical steelhead habitat and an important stronghold for east Columbia River populations in Oregon according to ODFW.

**F. Cost of Selected Alternative (Including Loss):** \$256,947\*

**\*Note:** A government-wide shutdown began on Oct. 1, 2013 that lasted nearly 3 weeks, decreasing the amount of time to implement some of the proposed treatments prior to the wet season. Additionally, there was a storm that dropped about 3.5 inches of precipitation over a 4 day period, during and afterwards of which it was observed that turbidity had not been notably elevated. Hence, the team felt that the aerial treatments that were initially prescribed could be abandoned, because their efficacy relative to the amount of observed post-storm erosion seemed debatable, particularly cost vs benefit. Estimated cost of the selected alternative sans the aerial treatments would amount to \$51,947 to implement and complete emergency treatments for values at high risk (i.e., prevent the spread of invasive species, protect a road segment, prevent public exposure to danger trees, and conduct storm patrols).

When the snowpack melted off in the spring of 2014, engineers were able to access the Slobber Road and assess its post-runoff condition. Some rill and gully erosion had occurred on the cut-slope, tread, and fill slope but the severity and magnitude was much less than initially anticipated, and there were no fill failures. The road was driveable and was not deemed to be in imminent threat. Planning began to do the post-fire BAER treatment that was initially prescribed to stormproof the road. But there existed a safety concern as the number of road-adjacent hazard trees remained high despite the felling at key locations the prior fall. The hazard and safety concern for workers was considered too high a risk. Also, the District was conducting analysis to conduct roadside salvage, which eventually would eliminate the hazard. Salvage generated funds could potentially pay for the stormproofing, and since the road had fared alright over the winter, it was felt that it could withstand another until the roadside salvage was completed. Hence, the BAER prescribed treatment was deferred.

As part of the public closure, several gates were installed at key access points to prevent entry into the burned area. During the spring of 2014, it was noticed that members of the public had breeched around the gates. Mushroom pickers and woodcutters were illegally gaining access into the burned area, and being exposed to the many road-adjacent hazard trees. It was agreed that the existing barriers needed to be enhanced to better insure security and safety. Some of the costing of the deferred treatments could be used to improve the road barriers. Estimated cost of the amended alternative sans the aerial and hand mulch treatments, and the road stormproofing, but with enhanced road barriers would amount to \$25,227.

**G. Skills Represented on Burned-Area Survey Team:**

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input type="checkbox"/> Range
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Botany	<input type="checkbox"/> Archaeology
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS

Team Leader: Todd Reinwald

Email: treinwald@fs.fed.us

Phone: 503-668-1769

FAX: 503-668-1423



## H. Treatment Narrative

All treatments are associated with high severity burn classifications and steep slopes, a segment of a historic road on steep slopes, and native bunchgrass meadows. See the treatment map for a display of proposed locations.

### Land Treatments

#### Treatment # L1. Invasive Species, **Status: Completed fall 2013**

Purpose: Control the spread of invasive plants and noxious weeds into special habitats.

Post-fire assessments will be conducted to insure early detection of invasive non-native plants and noxious weeds in about 56 acres of native bunchgrass meadows bisected by or adjacent to roads and that were burned over. Rapid response to control and prevent their spread would include treatments consistent with the Site-Specific Invasive Plant Treatments, Environmental Impact Statement (EIS) for the Mt. Hood National Forest and Columbia River Gorge National Scenic Area. Detection and control would occur in the meadow portions currently devoid of non-native invasive species, where the threat of spread from select segments (about 2.6 miles) of Forest Road 1711-193 and several segments (approx. 0.3 miles) of Forest Road 1711-630. The 1711-193 road extends out Mill Creek Ridge and serves as a primary vector for the spread of invasive plants to the native bunchgrass meadows considered to be special habitats. The road was used heavily during suppression activities and also serves as the primary access to the old Mill Creek lookout and the Mill Creek Research Natural Area. Several species of non-native invasive species have been observed along its length, including ventenata grass (*Ventenata dubia*), cheat grass (*Bromus tectorum*), and several knapweeds (*Centaurea* spp.). If found within 300 feet of either side of these road segments, eradication would include a mix of manual and chemical treatments, followed by seeding a mix locally adapted native species – e.g. Idaho fescue (*Festuca idahoensis*), California brome (*Bromus carinatus*), blue wildrye (*Elymus glaucus*), etc. – sown at an effective rate of approximately 50 Pure Live Seed (PLS)/ft<sup>2</sup>. Detection surveys and follow-up treatments would occur within one year after the fire in an effort to control spread.

#### Treatment # L2. Aerial\* and Manual Mulching, **Status: Deferred indefinitely**

Purpose: Minimize accelerated surface erosion in areas of high burn severity on steep slopes.

High burn severity on select sites where headwater convergence zones and steep draws are located were determined to be at a very high risk for accelerated erosion (109.3 acres). Since most of these steep slopes are inaccessible by motorized travel, aerial operations are proposed to treat them. Certain sites are considered a greater priority than others due to the density, size, and shape of their converging headwater draws.

Aerially (helicopter) mulch high burn severity areas at select sites (82 acres) on steep slopes (i.e. 30-60%) at a rate of approximately one ton of wood straw per acre to re-establish an immediate effective ground cover of at least 50 percent. A flight plan would need to be prepared and approved prior to aerial operations. Conduct similar mulching operations manually on several other select steep slopes (27 acres) bisected by the 1711-630 road where there is access. This could also be a potential location to try experimental seed and polymer mixes that are designed to improve quick germination and rooting. A test plot could be established next to the road and easily monitored. With the mulching treatments it is estimated that accelerated erosion could be reduced by 80 percent at the select locations.

**\*Note:** As described previously in section V.F., the team has recommended that the aerial mulching be abandoned, and it is not to be planned for implementation.

## Road Treatments

Purpose: To diminish the potential for damage to a select segment of Forest Road 1711-630 that is potentially eligible for the National Register of Historic Places and bisects steep slopes that were heavily burned over.

Treatment # R1. Stormproof a segment of the 1711-630 Road (locally known as the Slobber road), **Status: Deferred indefinitely**

The segment of this road between about MP 0.1 and MP 1.5 was predominantly full-bench construction with an improved native surface, and is characterized by a steep grade, narrow width, and high unravelling cut-banks. From the top of the ridge it bisects a headwall convergence zone with several steep draws, traversing through a rocky knob with shallow soils, then down across the bottom-third of a steep sideslope to the bottom of the canyon. Several small culverts drain under the road where it crosses the steep draws. There is no inboard ditch, nor any cross-drain culverts. Several widely-spaced un-reinforced drivable drain dips help to divert intercepted runoff. Due to the landform position of this segment of road and its condition it is at a high risk of damage from a heavy precipitation or high runoff event, and the intercepted flow on its tread could become concentrated and routed to steep and potentially unstable slopes, possibly accelerating erosion and exacerbating instability.

To alleviate the high risk of storm induced damage, emergency drainage on this segment of road would be improved so that it functions more effectively. On this segment of road a total of 24 drivable drain dips would be constructed. The outlets of at least 12 of those would be armored because they would drain onto very steep slopes below where soils are shallow. A combination of pit run and crushed 3 inch minus rock would be used to protect those specific drain dips and armor their outlets. Existing culvert inlet basins and their entry would be cleaned out. Wood straw would be added to burned over portions of cut slopes where it could be expected to stay in place to protect them from accelerated erosion. The many standing dead hazard trees where the drain dips would be installed would have to be removed prior to road work for worker safety. Some of those logs where felled in-place and full contact with the ground is achieved could also help moderate some accelerated erosion.

Treatment # R2. Storm Patrol, **Status: Completed late fall and early winter 2013**

Storm patrols would be conducted on the 1711 and 1711-630 road during the fall and winter of 2013 through 2015 to watch for poorly functioning drainage structure and the need for cleaning culvert inlets at crossings. If safe, personnel would drive these roads immediately after any storm event which has caused an annual bankfull event in the North or South Forks of Mill Creek to identify any potential problem sites.

## Protection/Safety Treatments

Purpose: Provide for the safe implementation of the BAER erosion control treatments by removing hazard trees.

Treatment # S1. Temporary General Road Closure with Signing and Traffic Control, **Status: In progress since fall 2013, additional enhancement needed 2014 due to breaching around gates and multiple incursions.**

There are numerous standing dead hazard trees along the roads within the fire perimeter. To protect the general public, and mitigate the risk of a tree(s), or tree parts from potentially striking anyone or their property and possessions these roads should be closed to public access. The term of the closure period would last until the hazard is sufficiently removed. Information signs and traffic control devices would be used to make the public aware of the hazards and reason for closure. Closure would also prevent access while BAER improvements were being made on the Slobber road.

Treatment #S2. Hazard Tree Removal, **Status: Completed fall 2013**

Remove the hazard trees where waterbars along the segment of the 1711-630 would be installed as described for Treatment R1. Hazard trees along the 1.4 mile segment of road would be removed prior to the BAER work to protect workers.

**Monitoring:**

**Status: in progress spring/summer 2014**

Effectiveness monitoring would be conducted in the spring of 2014 after the snows have melted to evaluate the effectiveness of Land Treatments 1 and 2, and Road Treatment 1. A monitoring plan would be prepared during BAER implementation with specific objectives and a predominantly qualitative and ocular methodology of how to measure the effectiveness of aerial and manual mulching, the seeding for preventing invasive weed spread, the road drainage improvements, and the cut-bank erosion control. Pre-monitoring devices that help measure erosion would be installed upon completion of BAER treatments.

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

### 3<sup>rd</sup> Ammendment Alternative

NFS Lands						Other Lands				All Total \$
Line Items	Units	Unit Cost	# of Units	BAER \$	Other \$	# of Units	Fed \$	# of Units	Non Fed \$	
<b>A. Land Treatments</b>										
#L1 Invasive Species	Each	\$8,000	1	\$8,000		Completed	\$0		\$0	\$8,000
#L2 Aerial Mulching	Acres	\$2,500	82	\$0		Treatment Deferred Indefinitely				\$0
#L2 Hand Mulching	Acres	\$1,700	15	\$0		Treatment Deferred Indefinitely				
#L2 Experimental seed plot	Acres	\$300	1	\$300		Not Completed				\$300
<i>Subtotal Land Treatments</i>				\$8,300	\$0		\$0		\$0	\$8,300
<b>B. Channel Treatments</b>										
				\$0			\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				\$0	\$0		\$0		\$0	\$0
<b>C. Road, Trails, Campgrounds</b>										
#R1 Stormproof 1711630	Each	\$6,400	1	\$0		Treatment Deferred Indefinitely				\$0
#R2 Storm Patrol	Each	\$4,000	1	\$4,000		Completed	\$0		\$0	\$4,000
							\$0		\$0	\$0
<i>Subtotal Road &amp; Trails</i>				\$4,000	\$0		\$0		\$0	\$4,000
<b>D. Protection/Safety</b>										
#S1 Temporary Road Closure	Each	\$2,500	1	\$7,680		In progress	\$0		\$0	\$7,680
#S2 Hazard Tree Removal	Miles	\$4,059	0.8	\$3,247		Completed	\$0		\$0	\$3,247
<i>Subtotal Protection</i>				\$10,927	\$0		\$0		\$0	\$10,927
<b>E. BAER Evaluation</b>										
BAER Assessment	Each	\$21,650	1	\$21,650	\$0	---		---		\$0
	---	---	---	---	\$0	---		---		\$0
<i>Subtotal Evaluation</i>				---	\$0	---	\$0	---	\$0	\$0
<b>F. Monitoring</b>										
#M1	Each			\$2,000		In progress	\$0		\$0	\$2,000
	Each						\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$2,000	\$0		\$0		\$0	\$2,000
<b>G. Totals</b>				\$25,227	\$0		\$0		\$0	\$25,227
Previously approved						Comments:				
Total for this request				\$25,227						

## **PART VII - APPROVALS**

1. /s/  
Forest Supervisor (signature) xx/xx/xx  
Date
  
2. /s/  
Regional Forester (signature) xx/xx/xx  
Date