USDA-FOREST SERVICE FS-2500-8 (6/06)

Date of Report: 10/23/2006

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**
[ ] 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: Mt. Hood Fire Complex

B. Fire Number: OR-MHF-140

C. State: Oregon

D. County: Hood River/WASCO

E. Region: 06

F. Forest: Mt. Hood National Forest

G. District: Hood River

H. Fire Incident Job Code: P6C22V

I. Date Fire Started: August 7, 2006

J. Date Fire Contained: 9-14-06

K. Suppression Cost: $ 10,000,000

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 18 miles (hand fireline), 3.3 miles (road fireline) stormproofed
2. Fireline seeded (miles): 0.5 miles (road fireline)
3. Other (identify):

M. Watershed Number: 1707010506, Bluegrass Fire 1707010508 & 1707030610, Gumjuwac Fire

N. Total Acres Burned: 1832

NFS Acres(**X**) Other Federal ( ) State ( ) Private ( )

O. Vegetation Types: Pacific Silver Fir Zone

P. Dominant Soils: The soils within the perimeter of the fire were derived from volcanic sources occurring on a highly glaciated landscape. Soils were mapped with a much higher rock content than is actually present. The unique geographic juxtaposition of Bluegrass Ridge to Mt. Hood has resulted in substantial amounts of wind deposited material composed of silt and fine sand particles that have blown off exposed areas on the mountain and deposited downwind on and around Bluegrass Ridge. The soil type atop Bluegrass Ridge (which is also the top of the fire area) is shallow and rocky, while the sideslopes are covered in 20 to 30 inches of fine, nearly rock free soil material.

Q. Geologic Types: Igneous units (basaltic andesites and pyroclastic flows): landforms are oversteepened glacial sideslopes developed from alpine glaciation; with small debris fans occurring at the major slope breaks just west of Robinhood Creek.

R. Miles of Stream Channels by Order or Class: 2.6 miles (intermittent), 2.1 miles (perennial)

S. Transportation System

Trails: 4.9 miles Roads: 2.5 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 818 (unburned) 610 (low) 377 (moderate) 28 (high)

B. Water-Repellent Soil (acres): 405 acres (all moderate and high burn severity soils show some evidence of water repellency)

C. Soil Erosion Hazard Rating (acres): (adjusted for slope with Washington DNR method)

423 (low) 82 (moderate) 1323 (high)

D. Erosion Potential: 19 tons/acre

E. Sediment Potential: 4079 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 80 %

C. Equivalent Design Recurrence Interval, (years): 25

D. Design Storm Duration, (hours): 24

E. Design Storm Magnitude, (inches): 7.0

F. Design Flow, (cubic feet / second/ square mile): 158 to 275

G. Estimated Reduction in Infiltration, (percent): 11 to 65

H. Adjusted Design Flow, (cfs per square mile): 186 to 602

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Trails:

The effect of the fire has increased the risk to human life and the trail, due to the fire undermining the tread of the trail, increasing the number of dead trees, increased runoff from the burned area, and the risk from future debris flow or flooding event taking out the bridge over Cold Springs Creek on the Elk Meadows Trail.

The Bluegrass Ridge Trail runs along the top of the ridge where the burn was most intense. It is a medium use equestrian and hiking trail and is often used as a loop combined with the Elk Meadows Trail. The trail will become more popular after the fire because the views of Mt Hood will be fantastic without the dense pole sized trees that lined the trail for most of its length.

Based on field reviews of the Bluegrass trail, damaged or at-risk portions of the trail within its entire 2 mile length inside the burn will need to be reconstructed to the minimum level necessary to protect human life and the existing investment in the trail and its functionality.. The large numbers of pole sized trees that line the trail have been killed and the roots partially burned. As these trees continue to blow over and the ground caves in near the stump holes and burned roots the trail will become even more unsafe for public horse and hiking use.

There is one bridge over Cold Springs creek that is threatened due to the inability of the structure to pass anticipated post-burn flows. The bridge is on the Elk Meadows Trail.

Soils:

Areas of high and moderate burn intensities removed effective groundcover in numerous unnamed drainages that flow into Robinhood Creek. The primary difference in mapping between high and moderate is the amount of canopy. Both have the duff consumed, but needlecast has started in the moderate areas, while there is no potential for needle cast in the high severity burn areas. The removal of effective soil cover has left the area in such a state that the potential for erosion and off-site sediment transport is very high.

There is a concern about potential loss of soil productivity due to accelerated soil erosion potential resulting from the absence of groundcover and presence of a thin hydrophobic layer at the soil surface. Where duff has been consumed, there is a higher likelihood of soil particle detachment by raindrop impact. In addition, soils in this area have weak surface structure, further increasing the risk of detachment by water or wind.

Soils mapped across the burn contain approximately 60% rock content. However, field observations showed the rock content to be only about 10%, thus increasing the risk of soil erosion.

Soil loss is anticipated primarily where burn intensity was highest, with moderate burn areas at high risk as well. Soil loss can have a significant impact on long-term soil productivity. Consumption of the organic, nutrient-rich duff and litter layer has already affected site productivity. The further loss of topsoil will additionally reduce site productivity. Therefore, it is important to keep the topsoil in place, not only from a physical standpoint, but also from a biological one as well since soil biological functions are so vital to forest productivity.

In forested soils of the west, an average rate of soil formation is about one ton of soil per acre per year. Without any stabilization treatments in the high and moderate burn intensity areas of this fire, we can expect to lose approximately 50 tons of soil per acre the first year with a 2½-year storm event, and 100 tons with a 5-year event. For visualization, this is about .37 of an inch of soil and .75 of an inch of soil per acre, respectively.

These first year erosion losses can be reduced significantly by slope treatment and stabilization measures. Rate of soil loss in subsequent years will depend on recovery rate of vegetation and litter cover accumulation.

Water Quality and Roads:

Two major stream systems drain the east and west flank of the Bluegrass Ridge portion of the Mt. Hood Complex fire. Robinhood Creek, a tributary to the East Fork Hood River, lies on the east flank of Bluegrass Ridge and drains northerly into the East Fork. Cold Springs Creek, a wilderness area stream is on the west flank of Bluegrass Ridge and empties into the East Fork approximately 2.5 miles downstream of the Robinhood confluence. Maintaining good water quality in both Robinhood Creek and Cold Springs Creek is important as these are clear water tributaries to the glacially fed East Fork Hood River. The two streams provide clean water refugia to aquatic organisms that use the East Fork as well as help dilute glacially derived suspended sediment in the East Fork during summer months.

The largest threat to water quality is sedimentation resulting from primary hillslope erosion and secondary sediment introduction by channel bed and bank erosion and erosion of roads. This sediment has the potential to degrade water quality in these two very important stream systems. The Bowl sub-basin (feeds into Robinhood Creek) has the highest risk for post-burn flooding due to the high and moderate severity burn coupled with the highly erosive soils in the basin. The Bowl also has a greater likelihood of debris torrent initiation due to the steep slopes and burn severity. The next highest risk for post-burn flooding and sedimentation is Robinhood sub-basin which is similar to the Bowl in burn severity and erosive soils.

An analysis of debris flow potential indicates several possible sources, all of which are steep gradient small intermittent or perennial tributaries to Robinhood Creek. All of the potential debris flows are expected to have run out zones that end at Robinhood Creek, which would contribute additional sediment to this system. This post-burn derived sediment and flooding pose a risk to the 3520620 and 3520650 Robinhood Creek crossings. These stream crossings are currently culverts that are a high risk to wash out when subjected to increased flood flows that are anticipated after the fire (12% to 133% increase over prefire flows for the 25 year event). Flood flow calculations indicate that the 3520620 crossing has a 35 to 45% chance of failure within the first year after the fire and a 65 to 75% chance of failure within the first 3 years. The 3520650 has an even greater chance due to the undersized culvert that is currently in place. In addition, one trail bridge is threatened due to the inability of the structure to pass anticipated post-burn flows.

By contrast, the Gumjuwac fire burned moderate to low severity on a ridgetop to the east of the Bluegrass Ridge fire. The majority of the burned area is on moderately sloping ground that drains into Badger Creek. Risks to water quality are minimal due to the low to moderate burn severity, small burn area and proximity to surface water. No BAER treatments are proposed for the Gumjuwac portion of the Mt. Hood Complex.

Fisheries

Although none of the streams within the fire perimeter are fish bearing, fisheries values immediately downstream in Robinhood Creek are at risk as a result of the fire. Fire-caused risks include impairment of fish habitat quality and aquatic ecosystem function, particularly due to increases in fine sediment resulting from erosion and/or small debris flows coming off the east face of Bluegrass Ridge into Robinhood Creek. Analysis results presented elsewhere in this report suggest relatively large amounts of sediment could enter Robinhood Creek in the first year to three years following the fire, perhaps further in the future, if mitigation measures are not undertaken. The degree of impairment will depend on the amount of sediment transported to Robinhood Creek, the magnitude of the debris flows (which in and of themselves could impair habitat by eroding and incising the stream channel), and the duration and/or timing of the events. Eventually, the sediment that enters Robinhood Creek will make its way into the East Fork Hood River, adding to its already significant sediment load. This could take years since Robinhood Creek is still flushing sediment from a large debris flow in 2000 out of the system.

Large amounts of sediment and/or channel degradation resulting from the events described above would lead to reduced rearing habitat for salmonids by filling pools and interstitial spaces in the substrate used by small fish for refuge. Spawning success could be reduced as suitable spawning gravel, already limited due to the 2000 debris flow, is covered by fine sediment. Insect food production could also be reduced as fine sediment inundates gravel and cobbles substrates that often provide the most suitable habitat for cold water aquatic insects. The above effects could be short or long term, depending on the amount of sediment and other

factors, but given the amount of fine sediment remaining in the system from the 2000 event it is likely the effects would be relatively long term.

Long term habitat impairment in Cold Springs Creek is not expected to be of large enough magnitude to significantly effect fisheries resources, although some short term reductions in habitat quality could occur as a result of hill slope erosion.

Invasive Plants:

Bulldozers and other equipment used to fight the fire may have brought in noxious weed seeds from many off-site locations. The burned area and newly constructed dozer and handlines may be invaded by invasive plants not currently growing in the vicinity of the Mt. Hood Fire Complex.

There are also 4 known noxious weed populations within ½ mile of the eastern edge of the burned area (all have been identified for future treatment under the 2006 Noxious Weed FEIS). The populations occur along roads that connect to the fire line. Noxious weed seeds from the nearby populations may be spread along the road corridors by vehicles, wildlife, hikers, bikers, and air currents.

B. Emergency Treatment Objectives:

Reduce the potential for surface erosion by aerially applying straw mulch and/or wheat seed to provide immediate ground cover prior to the first damaged producing storm, and additional ground cover as the wheat becomes established.

Prevent the probable fire-related failure of road and trail drainage structures/crossings (culverts or trail bridges) by either removing them and stabilizing the stream channel, or replacing them with larger culverts or trail bridge designed to handle anticipated post-fire streamflows, sediment, and debris.

Provide for the early detection of invasive plants invading the burned area from adjacent populations or various fire-fighting equipment (dozers, trucks, etc.).

Ensure the safety of BAER survey/implementation teams and the public by posting warning signs, removing hazard trees threatening the trail, and minimum repairs to the trail tread.

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

Land 80 % Channel N/A % Roads/Trails 75 % Protection/Safety 95 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	75%	70%	70%
Channel	N/A	N/A	N/A
Roads/Trails	90%	90%	90%
Protection/Safety	95%	95%	95%

E. Cost of No-Action (Including Loss): $1,273,200

F. Cost of Selected Alternative (Including Loss): $604,906

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Mark Kreiter

Email: mkreiter@fs.fed.us Phone: 541-308-1744 FAX:

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:

Treatment # L1, Invasive Species Detection Surveys and Monitoring

Purpose: First year monitoring will ensure early detection and identify subsequent treatment if necessary to prevent the spread of noxious weeds into the burned areas and into the Mt. Hood Wilderness where they would be difficult and costly to control. Detection surveys are intended to reduce the post-fire potential for significant increase in noxious weed populations that could spread into the burned area and quickly out-compete native vegetation which could cause erosion problems in the future. In order for native vegetation to establish successfully, new populations of noxious weeds need to be located after the burn and prevented from spreading.

Conduct Invasive Species (i.e, noxious weeds) detection surveys (monitoring) in 250 acres along the east fire line which is in close proximity to known noxious weed populations. Detection surveys would be conducted to determine if treatment of noxious weeds is warranted. If noxious weeds are detected the first year an invasive species emergency stabilization treatment and monitoring plan would be submitted to request funding for treatment and effectiveness monitoring the second year, and third year if necessary.

Acres (250) identified for detection surveys/monitoring were calculated based on a 300' buffer from the center (both sides) of 3 miles of fire line at the east edge of the burned area in sections 29, 30, 31, 32, and 6. An assumption has been made that this area of the Mt. Hood Complex is at greatest risk for spread of noxious weeds due to the proximity of known sites to seed dispersal corridors along roads that connect to the fire line, and their proximity to "Soil Burn Severity 3 and 4" burned areas.

Personnel costs were calculated based on a high intensity survey method which would require transects approximately 5'-8' apart through the survey area as defined above. Using the high intensity survey method it is expected that approximately 20 acres per day would be surveyed by a Forest Service botanist.

Treatment # L2, Aerial Seeding

Purpose: Aerial (helicopter) grass seed (Madsen White Wheat (high elevation) – 20 pure live seed per square foot or 871,200 pure live seeds per acre) all moderate and high burn severity areas to provide surface soil stabilization and reduce the soil erosion risk. White wheat was chosen as a short term cover, thus allowing native plants to re-establish.

Treatment # L3, Aerial Straw Mulching

Purpose: Aerial (helicopter) mulch all high burn severity areas at 1.25 tons of rice straw per acre to provide protective surface cover because of total duff layer consumption.

Treatment # L4, Log/straw erosion barriers

Purpose: Placement of LEB's/wattles in the high burn severity plantation directly above the 3520 road will provide breaks in hydraulic slope length, thus reducing erosion risk. Placement spacing is approximately every 30 feet.

Roads and Trail Treatments:

Treatment # R1, Road 3520650

Purpose: Remove existing culvert on Robinhood Creek and open up drainage to allow anticipated flood flows to pass through the crossing.

Treatment # R2, Road 3520620

Purpose: Remove trash rack and existing culvert and replace existing pipe with a new structure that will meet Northwest Forest Plan Standards and Guidelines as well as Regional direction for fish passage. The pipe will be removed in the fall and the new crossing will be installed the following spring/summer to allow passage of predicted increased flood flows and protect the 3520620 road system.

Protection/Safety Treatments (BAER Employee and Public):

Purpose: Implement actions to allow for BAER treatments along the Bluegrass Ridge Trail and to provide for safety of users and the BAER implementation teams. These treatments are intended to provide access to complete various BAER treatments and monitoring along the Bluegrass Ridge trail and to reduce the risk to personnel. This work will also reduce the risk to the public associated with trail use.

The Bluegrass Ridge Trail has been undermined by burned roots and blocked with fallen burned trees. As a result of these fire-related impacts, trail drainage features have been rendered non-functional and the tread condition represents a hazard to both BAER personnel, trail crews and the public. Finally, tree mortality and down fall across the trail will require logging out of the trails several times each year. Most trees fall in winter and spring.

Treatment #S1--Reconstruct Trail Drainage, Tread and Logout: Reconstruct to the minimum level necessary, approximately 2 miles of trail tread and drainage features and to reduce the potential for runoff concentration and accelerated surface erosion from anticipated fire effects and improve safety for BAER teams and the pubic. Trail work will follow established minimum National Forest trail standards.

Treatment #S2–Footbridge Replacement: Replacement a bridge over Cold Springs Creek to provide for public safety.

Treatment #S3–Trail and Campground Hazard Tree Abatement: As per new direction, inventory for and remove high hazard trees along the Bluegrass Trail.

Treatment #S4–Hazard warning signs, public information meetings: Install hazard signs, produce information packages and send press releases to inform the public of hazards.

Treatment Sequence

Following is an estimate of the sequence of treatments as described above:

1) Fire Area Closure
2) Log Erosion Barriers (LEB)
3) Aerial Grass Seed
4) Aerial Mulch
5) Pull Culverts on 3520620 and 3520650 Roads
6) Pull Trail Bridge
7) Install 3520620 Crossing
8) Install Trail Bridge
9) Invasive Plant Detection Surveys
10) Treat Bluegrass Trail
11) Monitor

I. Monitoring Narrative:

Implementation monitoring will be conducted on the aerial seeding, mulching and log erosion barriers. This monitoring will document planned and actual application rates of seed and mulch. In addition, 5 photo points will be established in the treatment block that has the seed, mulch and LEB to visually document growth and recovery in this block. Implementation monitoring will occur shortly after treatment while photo point records will document pre and post treatment recovery yearly for the 5 year recovery period.

Part VI – Emergency Stabilization Treatments and Source of Funds Interim # 1

A. Land Treatments										
L1, Invasive Plant Surveys	ea	$9,625	1	$9,625	$0		$0		$0	$9,625
L2, Aerial seeding	acre	302	353	$106,606	$0		$0		$0	$106,606
L3, Aerial straw mulching	acre	1188	36	$42,768	$0		$0		$0	$42,768
L4, Log/straw erosion barriers	acre	2110	5.5	$11,605						$11,605
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$170,604	$0		$0		$0	$170,604
B. Channel Treatments										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
R1, Culvert removal/rehabilitation	ea	5500	1	$5,500	$0		$0		$0	$5,500
R2, Culvert removal/replacement	ea	165,000	1	$165,000	$0		$0		$0	$165,000
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$170,500	$0		$0		$0	$170,500
D. Protection/Safety										
S1,Reconstruct tread/drainage	Mi.	15,000	2	$30,000	$0		$0		$0	$30,000
S2,Footbridge replacement	ea	5,000	1	$5,000	$0		$0		$0	$5,000
S3,Hazard tree abatement	ea	3500	1	$3,500	$0		$0		$0	$3,500
S4,Hazard signs/public info	ea	3,000	1	$2,000						$2,000
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$40,500	$0		$0		$0	$40,500
E. BAER Evaluation										
	ea	16000	1	$16,000			$0		$0	$16,000
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$16,000	$0		$0		$0	$16,000
F. Monitoring										
	ea	5000	1	$5,000	$0		$0		$0	$5,000
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$5,000	$0		$0		$0	$5,000
G. Totals				$402,604	$0		**$0**		**$0**	**$402,604**
Previously approved				$317,292						
Total for this request				**$85,312**						

PART VII - APPROVALS

1. _____ _____
Forest Supervisor (signature) Date

2. _____ _____
Regional Forester (signature) Date

References

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Bluegrass Fire - Soil Burn Severity and Debris Flow Potential