Date of Report: September 13, 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

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

[ ] 2. Interim Report #____.
[ ] 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: Gash Cr. Incident

B. Fire Number: MT-BRF-005058

C. State: MT

D. County: Ravalli

E. Region: R1

F. Forest: Bitterroot

G. District: Stevensville

H. Fire Incident Job Code: P-1C06V

I. Date Fire Started: 7/24/2006

J. Date Fire Contained: Not yet contained

K. Suppression Cost: $ 6.7 million

L. Fire Suppression Damages Repaired with Suppression Funds
1. **Fireline waterbarred (miles)**: 3 dozer (plus 5 reopened road miles)
2. **Fireline seeded (miles):** Waiting until October for favorable moisture conditions
3. **Other (identify):** Seeding for Helibase, ICP, and Drop Points on Pvt land, Multiple drop points and safety areas on Forest, remove ICP driveway and haul gravel to FS site.

M. Watershed Number: 170102051103 Sweathouse Creek, 170102051104 Big Creek (very few acres, Big Creek dropped from further analysis)

N. Total Acres Burned:
[8,201] NFS Acres [ ] Other Federal [ ] State [49] Private

O. Vegetation Types: Ponderosa Pine/Doug Fir/Beargrass, Mixed Conifer (Doug Fir/Lodgepole Pine/huckleberry), Lodgepole/Beargrass/Huckleberry, Subalpine Fir/Beargrass, Whitebark Pine/Subalpine Fir/Beargrass.

P. Dominant Soils: coarse textured ranging from coarse sandy loams to loamy coarse sands

Q. Geologic Types: Bitterroot Mountain Range, Glaciated landscape, Decomposed Granite, Idaho Batholith

R. Miles of Stream Channels:

Watershed	Stream Miles
Gash Creek	11.3
Sweathouse Creek	40.7
Smith Creek	9.6

(Not all stream miles are within fire perimeter)

S. Transportation System

Trails: 3.8 **miles** **Roads:** 20.6 **miles**

PART III - WATERSHED CONDITION

A. Burn Severity (acres):
Unburned: 2856 acres (37%) **Low:** 2422 acres (31%) **Moderate:** 1938 acres (23%) **High:** 785 acres (10%). Also, a total of 206 acres burned in Big Creek, a total of 0.9% of the Big Creek watershed and was dropped from further discussion.

B. Water-Repellent Soil (acres): approx. 1,754 acres (all of high severity, 50% of moderate severity acres = 34% of area within fire perimeter).

C. Soil Erosion Hazard Rating (acres): 4,123 **(low)** 2,994 **(moderate)** 1,414 **(high**)

D. Erosion Potential: 17.7 **tons/acre**[1] (Normal precip, 30.8 t/ac for 5yr RI precip year)

E. Sediment Potential: 8.50 **tons/acre**[2] **(**5,427 **cubic yards / square mile,** assumes 1T/cu yd**)**

[1] Results derived from Disturbed WEPP. Modeled high intensity fire in the uplands and riparian, sandy loam soil, 30-50% slope, 10% ground cover , 30% rock, and Stevensville modified climate. This is a worse case analysis.
[2] Results derived from ERMiT. Modeled high intensity fire, sandy loam soil, 30% rock, 50% slope, and Stevensville modified climate. This is a worse case analysis.

PART IV - HYDROLOGIC DESIGN FACTORS

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

B. Design Chance of Success, (percent): 75%

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

D. Design Storm Duration, (hours): 0.25 hours

E. Design Storm Magnitude, (inches): 0.53 inches

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

G. Estimated Reduction in Infiltration, (percent): 25 %

H. Adjusted Design Flow, (cfs per square mile): 110 cfsm[3]

[3] Use 110 cfsm for watershed less than 2 mi^2; Parret et al. 2003. Fire Hydrology. July 2003. For watersheds 5-20 mi^2, the design storm should be approximately 23 cfsm; Arkell Richard E, and Frank Richards, 1986. Short Duration Rainfall Relations for the Western United States. August 1986. Gerhardt, N, 2003. Precipitation – Frequency Values for Lolo Pass, Idaho/Montana. Unpublished Paper. September 2003

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats (narrative):

Critical Values/Resources and threats: **No downstream threats to life from storm events were found in the Gash Creek Fire Area, however, the following threats were deemed significant.**

1. Human safety on burned-over trails – Fire-weakened trees (snags) on Glen Lake Trail pose threat to trail users;
2. Road Crossings/infrastructure – post-fire hydrology will increase risk of losing undersized culverts at (4) road crossings (3 on Gash Creek & tribs, 1 on Smith Cr);
3. Road Prism infrastructure within High/Moderate Burn Severity – post-fire hydrology will increase risk of unacceptable erosion on approximately 6.8 miles of road prism (FR1321, FR1325), creating reconstruction and maintenance costs;
4. Trail Prism infrastructue within High/Moderate Burn Severity – post-fire hydrology will increase risk of unacceptable erosion on Glen Lake Trail, from trailhead to Glenn Lake.
5. Previously weed-free areas within High/moderate burn severity – loss of competing vegetation due to the fire will enable progressive migration of roadside weeds into new areas.
6. Wilderness Boundary Identification – the fire cause loss of signs identifying the wilderness boundary in several high and moderate severity burn areas. Lack of signs and fire-thinned vegetation will increase risk of snowmobile encroachment into wilderness.
7. Potential risk to people using area roads during storm events, from flooding, rockfall, and hazard trees.

B. Emergency Treatment Objectives (narrative):

1. Hazard Tree Trail Treatment - Cut and remove standing, leaning, and fallen hazard trees that were weakened as a result of the fires. Improve trail user safety.
2. Install Corrugated Metal Pipe - The purpose of the treatment is to reduce the risk that stream flows will overtop the road. Sites were chosen based on high burn intensity of drainages above the roadways involved. Because of the probability of increased stream flows, culverts in these locations are at greater risk of being inadequate in size, or becoming plugged.
3. Road Prism Infrastructure
    a. Install Diversion Dips on Roads - Roads 1321, 1325 on Forest Service have stream crossings that have been affected by the Gash Cr Fire and now need the addition of dips to assure that stream flows remain within the stream channel and are not diverted down the roadways. The dips will need riprap armor mostly on the outlet side of the roads, crushed aggregate on the newly reshaped roadway, and seeding of any newly disturbed ground not receiving aggregate or riprap.
    b. Install Drive-through Drain Dips on Roads - Roads 1321, 1325 on Forest Service have segments that have been affected by the Gash Cr Fire and now need the addition of dips to assure that surface flows originating from high and moderate severity areas within the burn are cross-drained off the road prism and are not diverted down the roadways.
    c. Improve Road Prism Drainage – Roads 1321 and 1325 on Forest Service have segments that will be degraded by post-fire hydrology and now need proper grading and compaction. This action would assure that surface flows originating from high and moderate severity areas within the burn are cross-drained off the road prism and are not diverted down the roadways.

4. Install Waterbars Trail - The waterbars are intended to prevent accelerated erosion by diverting, discharging, and dissipating runoff flowing down trail tread. This protects watersheds by lessening the force and concentration of water flowing downslope.
5. Invasive Species

    a. Heli-seeding cut/fill slopes and open ponderosa pine plant communities with native grasses is intended to reduce the spread of invasive species from the roadside areas into a south-facing Ponderosa Pine stand that was relatively weed-free before the fire. Native grasses would compete with knapweed and other invasive species until a full complement of native plants can develop.
    b. Weed Monitoring would track populations of invasive species for management purposes. Target areas for weed treatments would be identified and mapped. Monitoring will be focused on detecting new weed infestations within the fire perimeter. Monitor known and high potential infestation sites for noxious weed species in the burned area and determine need and extent of control treatment to be implemented. Monitor weed treatments results to ensure objectives are being met. During 2007, monitor spread of weeds into the burn area and any control treatments for effectiveness. Accurately map any new populations using GPS. Establish photo plots for documentation as needed.
    c. Heliseeding effectiveness monitoring – would track the effectiveness of the heli-seeding. Goals for the monitoring include feedback to future BAER treatments, and maintenance of a native plant community in the treatment polygon.
6. Sign Wilderness Boundary – signing is intended to identify wilderness boundary where signs previously existed, protect wilderness experience and resource from over-snow motorized intrusions.
7. Sign access roads for Hazards – appropriate road signs would be established at access points to NFS lands within the fire perimeter.

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

Land 90**%** **Channel** NA **Roads/Trails** 95**%** **Protection/Safety** 95**%**

D. Probability of Treatment Success

	Years after Treatment		
	1	**3**	**5**
Land	90	95	95
Channel	NA	NA	NA
Roads/Trails			
Gash Trib culvert #2 upgrade*	65	80	95
South Fork Gash culvert upgrades #3 & #4**	90	95	95
Road grading,	85	90	95

rolling, armor culvert inlets & dips			
Trail waterbars	90	95	95
Protection/Safety			
Hazard signs	95	95	95
Trail hazard tree falling	90	95	95

* Gash Trib culvert #2 removal – this culvert is recommended for removal until fall 2007, as potential to lose the upsized replacement culvert by debris flows is high throughout summer 2007. Probability of success for removed culvert is 100 %, 90% for upsized culvert through 2009, 95% 2011 and beyond. If culvert is upsized before summer 2007, probability of success is 60-70%.

**South Fork Gash culvert upgrades crossings #3 & #4 – these culverts are suggested for replacement in fall 2006 or spring 2007 and are likely to withstand predicted high flows. Probability of a debris flow is low for these crossings. Probability of success (withstanding high flow) is 90% in year one, 95% in year 95%

E. Cost of No-Action (Including Loss): XXX

F. Cost of Selected Alternative (Including Loss): $103,636

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Ed Snook

Email: esnook@fs.fed.us **Phone**: 406.363.7103 **FAX**: XXX

Specialty	Team Members
Hydrologist	Richard Jones (SO, Clearwater NF)
Hydrologist - trainee	Robert Sanchez (SO, Clearwater NF)
Soil Scientists	Cole Mayn (SO, BNF
Fisheries	Rob Brassfield (D-1, BNF)
Botany	Linda P. (SO, BNF)
GIS	Kevin Hyde (contractor, Forest Sciences Lab, Missoula)

Engineering/Roads	Rich Raines (SO, BNF)
Heritage	Mary Williams (SO, BNF)
Fiscal Mgmt/Purchasing	Laurie Claar (SO, BNF), Tina Mainey(SO, BNF)
Recreation/Trails	Gene Hardin (D3, BNF) Bill Goslin (D1, BNF)
Wildlife Biologist	Dave Lockman (D1, BNF)
Invasive species, Range	Gil Gale (D3, BNF)

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:

Hydro-seeding cut/fill slopes and open ponderosa pine plant communities

Objective:

The purpose of the treatment would be to supplement existing bunchgrass communities to assist in competition with spotted knapweed post-fire seed colonization. Such treatments were successful at reducing weed densities for Canada thistle (Cirsium arvense) and musk thistle (Carduus nutans) in the Mesa Verde National Park (Floyd et al. 2006). Seeding rates are low in order not to compete with native vegetation that is recovering post-fire. Fill and cut slopes as well as upland slopes that can be reached with the hydroseeder will be treated (up to 200 feet off the road). Areas will be treated with a mixture of native short-lived and perennial grass species, including Idaho fescue and bluebunch wheatgrass, which are components of the existing pre-fire vegetation. Slender wheatgrass is another native species that germinates quickly to give the site a competitive advantage the first season. The native mix shall be sown at 6.4 lbs/acre PLC (30 seeds/ft.2).

Methods:

Conduct weed control seeding treatment on open, south facing slopes with known spotted knapweed infestations. Purpose of the treatment would be to supplement existing bunchgrass communities to assist in competition with spotted knapweed post-fire seed colonization. Such treatments were successful at reducing weed densities for Canada thistle *(Cirsium arvense)* and musk thistle *(Carduus nutans)* in the Mesa Verde National Park (Floyd *et al*. 2006). Seeding rates are low in order not to compete with native vegetation that is recovering post-fire. Areas will be treated with a mixture of native short-lived and perennial grass species, including Idaho fescue and bluebunch wheatgrass, which are components of the existing pre-fire vegetation. Slender wheatgrass is another native species that germinates quickly to give the site a competitive advantage the first season. The native mix shall be sown at 6.4 lbs/acre PLC (30 seeds/ft.^{2}) and consists of:

Idaho fescue	*Festuca idahoensis*	40%	1.16 lb/acre
Slender wheatgrass	*Elymus trachycaulus*	30%	2.43 lb/acre
Bluebunch wheatgrass	*Pseudoroegneria spicata*	30%	2.82 lb/acre

Noxious Weeds Control/Treatment

Objective

The purpose of the treatment is to maintain ecosystem integrity within the Sweathouse Creek watershed area, where known noxious weed populations exist. Without treatment knapweed would spread into the severely burned areas. By reducing the amount of weed seed along roads in the area, native species will have an opportunity to take advantage of the post-fire nutrient flush without competition from noxious weeds.

Methods

Treat fire access road areas with picloram (Tordon 22K) or clopyralid (Transline or Stinger) where there are known noxious weed populations. Selected sites include roadside spraying along FDR1321 and FDR 1325 where heavy canopy loss has increased the risk of knapweed *(Centaurea maculosa)* spreading down slope. Effects of herbicide treatments at the proposed rates using clopyralid or picloram are addressed in the Bitterroot National Forest Noxious Weed Environmental Assessment.

Channel Treatments: None

Roads and Trail Treatments:

Install Water Bars - Trails

Objective

Approximately 5 miles of trail are expected to be at risk of deterioration from additional runoff and sediment from post-fire conditions. The threats are from upland slope erosion and flow being deposited on the trail. The trails were not designed for the increased flow that may occur from the fire. This may cause soil erosion on the trail surface and fill-slope. Failure of drainage culverts and water bars may cause stream capture onto trail surface area causing soil erosion, including loss of the trail by rilling and gullying. Trail Number 232 for a total of 3.8 miles of trail are included in this list.

Methods

Methods for reducing this risk include 42 water bars, which would be used to direct and divert flow to areas off the trail or to drainage ways. These treatments, along with the cleaning of 20 existing water bars would reduce the risk of the trail washing out and transporting sediment to streams.

Install Diversion Dips On Roads

Objective

Four road crossings are at risk of failure due to post-fire hydrology. The objective of diversion dips adjacent to these crossings is to prevent flood flows from running down the road if the culvert is plugged or overtopped. This is possible even with culvert upsizing, due to jamming of the culvert with woody debris or rock.

Methods
Methods for reducing this risk include installing diversion dips immediately below stream crossings on Forest Roads 1321 (1), 737 (1), and 1325 (4), for a total of (6). The upper and lower fills would be rip-rapped at the dip location to prevent downcutting and loss of the crossing.

Install Drive-through Dips On Roads

Objective
6.8 miles of road within high and moderate severity fire areas are at risk of accelerated erosion due to post-fire hydrology. Increased surface flow is likely to rut or erode road surfaces and require extensive maintenance.

Methods
Road segments within or immediately below high and moderate severity burn areas would receive drive-through drain dips where needed, to improve cross-drainage. A total of eight (8) drain dips would be built into Forest Roads 1321 and 1325 within high and moderate severity burn areas.

Install Corrugated Metal Pipe

Objective:
The purpose of the treatment is to reduce the risk that stream flows will overtop the road. Sites were chosen based on high burn intensity of drainages above the roadways involved. Because of the probability of increased stream flows culverts in these locations are at greater risk of being inadequate in size and could trigger or add to debris torrents.

Methods:
Excavate and replace larger culverts at (3) indicated sites. Riprap will be placed at inlets or outlets to reduce risk of scour. Newly disturbed road surface will receive 4” thickness 1” minus compacted aggregate. Newly disturbed areas that do not receive aggregate or riprap will be seeded.

Grade and Stabilize Road Surface

Objectives:
The purpose of the treatment is to assure that surface flows originating in high and moderate severity burn areas do not travel down roadways. Sites were chosen based on burn severity of drainages above the roadway involved.

Methods:

Treat road with grader during appropriate moisture. Follow immediately with roller to improve compaction and resistance to rutting, rilling and sheet erosion.

Protection/Safety Treatments:

Remove Hazard Tree - Trails

Objective

This treatment reduces the chance for injury or loss of life from falling snags on trails by reducing the number of hazard trees along the trails.

Methods

Fell and remove any hazardous burned trees (within one tree height) that are located along trails. Maintain snags >12" where possible for wildlife trees, however do not compromise safety.

Sign Roads for Hazards

Objective

To provide for public health and safety. These signs are necessary to inform the public of immediate danger posed by storm events and falling rocks and trees.

Methods

Hazard warning signs should be developed for immediate installation along roads and trails within the burned area for protection of life and property. Signs are designed to notify the public of watersheds that are likely to sustain flash flood and/or mud/debris flows and falling rock and trees that may enter roadways or trails due to storm runoff and slope instability from fire effects to burned watersheds**.**

Sign Wilderness Boundary

Objective

To protect the wilderness from snowmobile trespass made possible by fire affects. The paint is burned off the old signs and/or the trees holding the signs have fallen. The fire cleared undergrowth and young trees making snowmobile travel in the vicinity of the wilderness boundary more feasible. The wilderness boundary on the ground is indefinite in some locations.

Methods

Replace 80 standard wilderness boundary signs along 1.5 miles of wilderness boundary There are six miles of burnt wilderness boundary total. Not all 6 miles are at risk from snowmobile trespass.

I. Monitoring Narrative:

(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Monitoring will be focused on first year effectiveness of BAER treatments. The question to be answered is did the BAER treatments provide the needed protection and rehabilitation of the burned area.

Noxious Weed Monitoring

Monitor known and high potential infestation sites for noxious weed species in the burned area and determine need and extent of control treatment to be implemented. Monitor weed treatments results to ensure objectives are being met. During 2007, monitor effectiveness of the spraying and establishment of new weed populations. Accurately map new populations using GPS and GIS. Establish photo plots for documentation.

Heliseed Effectiveness Monitoring

Monitor the establishment and spread of noxious weeds, and where the heliseeding treatment has been applied.. Determine areas for weed control treatments. The objective of this specification is to monitor the effectiveness of the heli-seeding treatment. This monitoring would be appropriate for 2-3 years after the application.

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #

A. Land Treatments										
Heli seed & mulch	acres	495	60	$29,700	$0		$0		$0	$29,700
Weed spray	acres	33	75	$2,475	$0		$0		$0	$2,475
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$32,175	$0		$0		$0	$32,175
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										
trail waterbar	miles	1258	3.8	$4,780	$0		$0		$0	$4,780
armored diversion dips	dips	2453	6	$14,718	$0		$0		$0	$14,718
driveable dips - roads	dips	874	8	$6,992	$0		$0		$0	$6,992
Install CMPs	pipes	8,475	3	$25,425	$0		$0		$0	$25,425
Grade & stabilize Road	miles	985	6.8	$6,698			$0		$0	$6,698
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$58,613	$0		$0		$0	$58,613
D. Protection/Safety										
trail- hazard tree	miles	1407	3.8	$5,347	$0		$0		$0	$5,347
Haz warning signs	signs	449	4	$1,796	$0		$0		$0	$1,796
wilderness boundary si	signs	9	80	$720	$0		$0		$0	$720
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$7,863	$0		$0		$0	$7,863
E. BAER Evaluation										
team costs				$12,981			$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$12,981	$0		$0		$0	$0
F. Monitoring										
nox weed monitoring	acres	8	290	$2,320	$0		$0		$0	$2,320
heliseed monitoring	acres	65	41	$2,665			$0		$0	$2,665
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$4,985	$0		$0		$0	$4,985
G. Totals				$103,636	$0		**$0**		**$0**	**$103,636**
Previously approved										
Total for this request				**$103,636**						

PART VII - APPROVALS

1. _____ _____
Forest Supervisor (signature) Date

2. _____ _____
Regional Forester (signature) Date