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

Date of Report: September 11, 2007

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
[X] Updating the initial funding request based on more accurate site data or design analysis
[ ] Status of accomplishments to date

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

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Skyland

B. Fire Number: MT-FNF-000035

C. State: Montana

D. County: Glacier and Pondera and Flathead

E. Region: Northern

F. Forest: Lewis and Clark/Flathead

G. District: Rocky Mountain/Hungry Horse

H. Fire Incident Job Code: PD1S6J

I. Date Fire Started: July 23, 2007

J. Date Fire Contained: est Oct 1, 2007

K. Suppression Cost: $17.9 million

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline rehabilitated (miles): In progress

2. Fireline seeded (miles): To be determined
3. Other (identify):

M. Watershed Number: 1003020101, 10701020701, 1003020102

N. Total Acres Burned:
NFS Acres (48,907) Other (Blackfeet Nation) (10,561) State (0) Private (396)

O. Vegetation Types: lodgepole pine, Douglas fir, subalpine fir, spruce, limber pine, whitebark pine, aspen, and grassland/shrubland.

P. Dominant Soils: Typic and Andic Cryochrepts, Typic Cryoborolls
Q. Geologic Types: --Paleozoic limestones of the Sawtooth Range, Cretaceous sandstones and shales below, Pleistocene glacial tills

R. Miles of Stream Channels by Order or Class: 1st order 196 miles, 2nd order 125 miles, 3 3nd order 31 miles, 4th order 20 miles, 5th order 12 miles

S. Transportation System

Trails: 53 miles Roads: 34 miles

PART III - WATERSHED CONDITION

A. Burn Intensity____ Burn Intensity rates the effect of fire on vegetation

Ownership	Class 2 - Low	Class 3 - Moderate	Class 4 - High	Class 5 - Burned Grassland	Grand Total	%
Blackfeet Nation	1,429	1,549	1,353	6,447	10,778	24
Flathead National Forest	310	1,970	872	234	3,386	7
Lewis and Clark National Forest	8,535	6,963	12,640	2,384	30,522	68
Private	5	288	2	116	411	1
Total	10,279	10,770	14,867	9,181	45,097	100
%	23	24	33	20	100	

A. Burn Severity (acres): _to date__ Soil Burn Severity is the effect of fire on soil and the ecosystem.

Ownership	Soil Burn Severity			UNBURNED	OTHER (Rockland, water etc)	TOTAL
	HIGH	MOD	LOW			
Blackfeet Nation	338	2,031	7,978	214	0	10,561(23%)
Private	0	203	192	1	0	396(1%)
Flathead National Forest	218	1,990	974	47	463	3,692 (8%)
Lewis and Clark National Forest	3,160	13,722	10,953	1,280	1,450	30,565 (68%)
Grand Total	3,717 (8%)	17,946 (41%)	20,097 (44%)	1,542 (3%)	1,913 (4%)	45,215

B. Water-Repellent Soil (acres): 45,215

C. Soil Erosion Hazard Rating (acres): 22,156 (low) 23,059 (moderate and high)

D. Erosion Potential: 0 ton/acre (low severity), 8.5 ton/acre (high severity)

E. Sediment Potential: 0.042 tons/acre

PART IV - HYDROLOGIC DESIGN FACTORS

To be determined

A. Estimated Vegetative Recovery Period, (years):	2 grass shrub, 20-50 conifers
B. Design Chance of Success, (percent):	70
C. Equivalent Design Recurrence Interval, (years):	5
D. Design Storm Duration, (hours):	6 and 1 hour
E. Design Storm Magnitude, (inches):	1.7 (6hr) 1.1 (1 hr)
F. Design Flow, (cubic feet/second/square mile):	26.6
G. Estimated Reduction in Infiltration, (percent):	56
H. Adjusted Design Flow, (cfs per square mile):	77

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats: Note: This analysis covers both the Flathead and the Lewis and Clark National Forests. See the spreadsheet for the spread of funding requests between them.

Weeds: The potential for accelerated expansion of noxious weed species within the fire perimeter, especially along trails is high. The Lewis and Clark National Forest also has a Weeds EIS, and mapped locations. More were identified and mapped in this analysis. Moderate to high intensity and severity burn acres provide ideal seedbeds for noxious weed establishment with little competition from native vegetation.

Fisheries/Aquatics: The Skyland Fire impacted much of the upper South Fork Two Medicine River drainage, which supports several 90-99% genetically pure WCT fisheries, and most of the Whiterock Creek drainage which supports a 100% genetically pure WCT fishery. A partial fish kill was documented in Whiterock Creek and the small surviving population is now at risk from ash and sediment flows from steep, severely burned slopes in the headwaters. The Skyland Fire also burned hot across the headwaters of Red Poacher Creek, a WCT spawning and rearing stream that supports the 100% pure WCT fishery of North Badger Creek. Potential ash and sediment flows from burned areas now threaten most of these fish habitats. Because the fire burned unusually hot through many riparian areas, it undoubtedly caused significant mortality of western toads, another aquatic sensitive species known to be present in these drainages. Major portions of the fire interior continued to burn out after the intensity layer was created from satellite imagery, so effects will be greater than predicted. Additional analysis will be conducted for the fisheries resource.

NFS Road System: Three road crossings in the Skyland fire are at risk. The Skyland fire poses threats to Skyland Creek road 569, spur road 1653, and Pike Creek road from 8958 from undersized culverts, inadequate road drainage to handle increased overland flow, and plugging of ditches and ditch relief culverts. Flathead NF roads 9603, 5209, 569, and 1653 are subject to accelerated erosion. Several road crossing drainage ditches are at risk from plugging and overtopping and localized sections of roads are subject to increased erosion from ditch clogging.

Trails: Within the Skyland fire perimeter 36 miles of NFS system trails have been burned over with a moderate to high intensity wildfire. The trails system is the only transportation system within the Badger-Two Medicine portion of the Rocky Mountain Ranger District. The trail system provides access for year around recreation opportunities, cattle allotments, hunting opportunities, fire suppression, wildlife surveys, and culturally significant sites.

These trail miles occur on steep side slopes that are very susceptible to erosion events during normal runoff years. A large fire event such as the Skyland fire makes the trails system susceptible to washouts, gullying, and rilling during the upcoming fall and spring runoff events. The increased erosion associated with the fire event will increase the risk to ecological health, stream sedimentation, and public safety within the fire area.

B. Emergency Treatment Objectives:

Land Treatments – The objective of weed treatment and detection is to reduce weed expansion by ground-treatment and early detection along roads, trails, and areas having known presence.

Road treatments – Decrease the risk of diverting overland flow and stream flow down roadways, accelerating erosion, and damaging road facilities. Culvert replacement is designed to reduce the risk that stream flows will overtop the road and potentially damage the road and or culvert. The road treatments are also designed to reduce sediment yield to WCT fisheries (Pike Creek).

Trail Treatments - The detrimental post-fire effects on the trails system can be mitigated with the proposed work of installing drainage structures (i.e water bars and drain dips), replacing culverts, and shoring up trails with curb logs and cribbing**. For safety and resource concerns, four puncheon bridges need to be repaired for trail crew access across muddy sections of the trail system in need of repaired.**

The objective of the hazard tree treatments is to protect BAER workers from dangerous trees near trails or roads on which they are working. Since this is largely wilderness, only trees presenting a clear and present danger will be removed.

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

Land **80** % Channel **80** % Roads/Trails **80** % Protection/Safety **90** %

D. Probability of Treatment Success:

	Years after Treatment		
	1	3	5
Land	**80**	**100**	
Channel			
Roads/Trails	**80**	**80**	
Protection/Safety	**95**	**100**	

E. E. Cost of No-Action (Including Loss): See attachment for Values at Risk Analysis. Results follow: Lewis and Clark National Forest

- Treatments to increase existing culvert capacity on the Lewis and Clark NF totaling $22,080 are justified base on a B/C ratio of .96 with an implied minimum value of $1000 to avoid detrimental effect to Pike Creek water quality and maintain recreation access.

- Treatments to water features and required hazard tree removal on trail systems within the Lewis and Clark NF portion of the Skyland Fire totaling $184,310 are justified based on direct monetary values with a B/C ratio of 1.6. These treatments have a high probability of supporting high valued recreation use, protecting water quality resources, and historic cultural values.
- Burned fence replacement totaling $8010 on the Lewis and Clark NF is justified to protect ecological integrity and soil productivity within the burned area. It is the BAER team's opinion that the value of protecting these resources exceeds the implied minimum value of $8900. Additionally, this treatment supports direct market values with a B/C ratio for monetary values alone of 3.1.
- Weed treatments and monitoring on 67 miles of roads and trails totaling $15,460 on the Lewis and Clark NF are justified to protect ecological integrity, soil productivity, and reduced weed spread potential on burned areas and onto currently unburned areas. It is the BAER teams opinion that the value of protecting the ecological integrity and soil productivity from infestation easily exceeds the $17,371 implied minimum value.

Flathead National Forest

-Treatments to increase existing culvert capacity on the Flathead NF totaling $48,450 are justified base on a B/C ratio of 1.6. These treatments will support access to high valued recreation areas and protect water quality on Skyland Creek.

-Weed treatments and monitoring on 9 miles of roads and trails totaling $3708 on the Flathead NF are justified to protect ecological integrity, soil productivity, and reduced weed spread potential on burned areas and onto currently unburned areas. It is the BAER teams opinion that the value of protecting the ecological integrity and soil productivity from infestation easily exceeds the $4166 implied minimum value.

F. Cost of Selected Alternative (Including Loss): **See above.**

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Henry Shovic

Email:hshovic@fs.fed.us Phone:406-570-7946 (cell) FAX406-xxx-xxxx

H. **Treatment Narrative:**

Land Treatments:

Noxious Weed/Invasive Treatment: Treat noxious weed/invasive species infestation sites within the burned area to prevent remove the population and prevent the expansion of weeds into newly disturbed sites. Integrated pest management techniques (chemical, biological, mechanical, and cultural control methods) would be used to prevent the spread and establishment of noxious weeds, especially within the moderate to high intensity burn areas.

Noxious Weed/Invasive Species Detection: Monitor noxious weed treatment, as described in the specification sheet, in the first year following chemical or biological treatment to determine success of weed control. Monitoring would also include looking for new weed infestations and prescribing appropriate treatments.

Channel Treatments:

Roads and Trail Treatments:

Treatments identified for implementation include upgrading 4 culverts in the Skyland fire.

In addition the proposed maintenance/cleaning, additional ditch relief culverts, with armored dips, and road hazard tree removal) crews. On the Flathead NF proposed for installing, clearing hazard trees for

Fire	Culvert	Culvert Size (ft)	Upgraded Culvert Size (ft)
Skyland	11	1.5	3
Skyland	12	1.5	3
Skyland	15	2	3
Skyland	16	2	4

treatments include ditch cleaning ditch relief culverts, installation of augmenting road drainage around culverts removing additional (beyond fire suppression hazard trees to protect BAER treatment Roads 9603, 5209, 569, and 1653 are cleaning, and maintaining waterbars and worker safety.

On the Skyland fire the installation or reinstallation of 215 drainage structures, 28 culverts, 100 ft of puncheon bridge, 541 ft of cribbing, 500 feet of ditching, and 809 feet of curb logs. Work will be in accordance with EM-7720-102 standard specification for construction of trails.

For trails: The removal of hazard trees on all associated miles of trails is required to provide a safe working environment for BAER crews if they are to accomplish the work necessary to mitigate post-fire erosion.

The reconstruction of four damaged puncheon bridges was discussed with the regional coordinator. It was agreed upon that it was necessary to rebuild the bridges for safety and resource concerns. Safety concerns are for the trail crews and pack strings to cross muddy sections of the trail to gain access the other damaged segments of the trail system. All work will be performed by district trail crews (force account).

Signs: Eight hazard signs are specified to warn the public of watershed and enhanced wildlife hazards from the fire.

Protection/Safety Treatments:

I. **Monitoring Narrative:**
The monitoring specified is to be completed by a five-individual team of resource specialists for a one day review. It's purpose is to determine treatment completion and effectiveness.

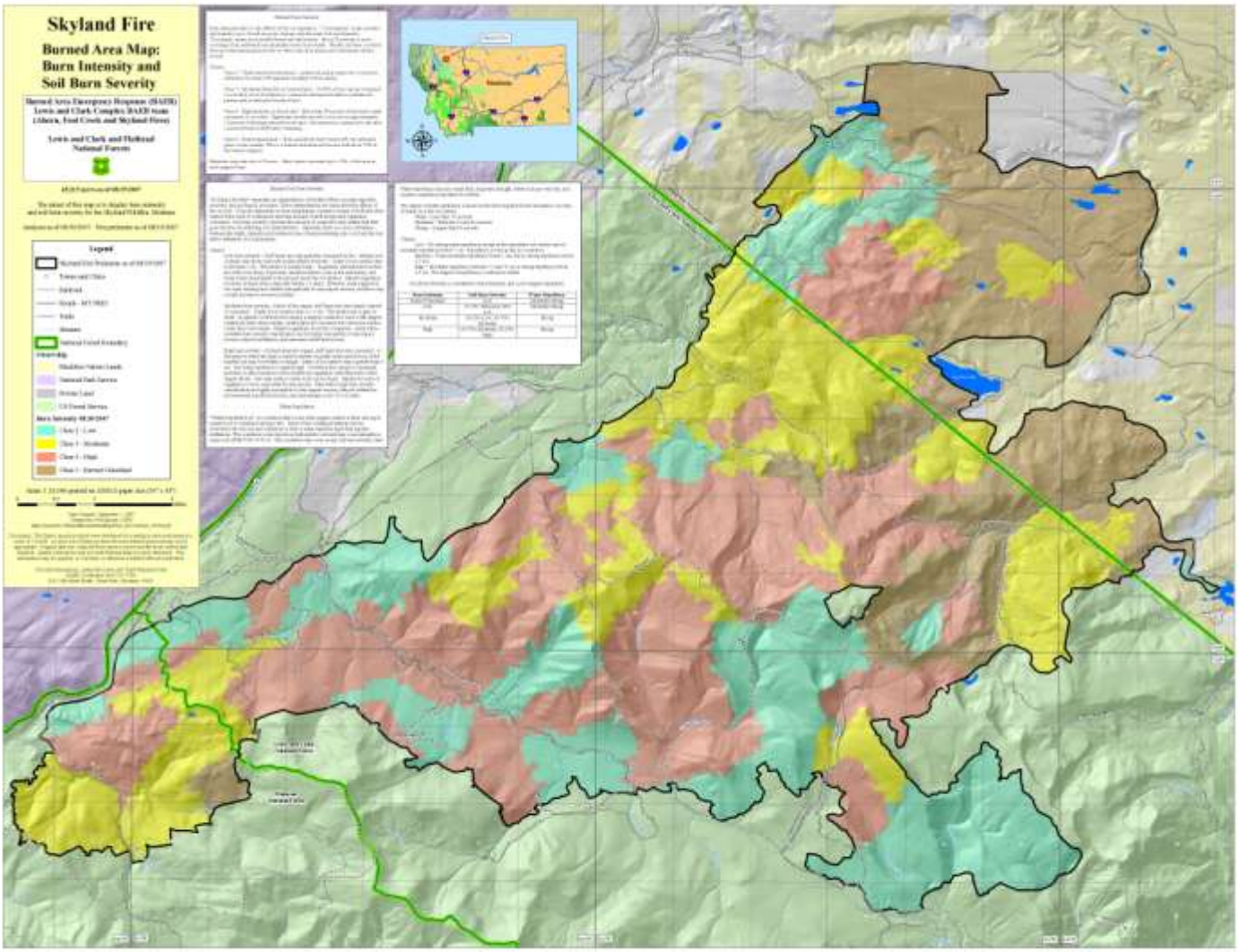
Part VI – Emergency Stabilization Treatments and Source of Funds

Seeding	ac	15	60	$900						
Temporary Fence and Repair	Miles	2	3564	$7,128						
Subtotal Land Treatments				$38,466	$0		$0		$0	$23,875
B. Channel Treatments										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
Install Drainage Structures on Trail	Miles	28	2802	$78,456			$0		$0	$78,456
Install Drainage Struc. FNF	ea	1	3000	$3,000			$0		$0	$38,466
Install Drainage struc (36") FNF	EA	3	17766	$53,298			$0		$0	$0
Install Drainage struc.(48") LCNF	EA	1	14148	$14,148			$0		$0	$14,148
Punchon Bridge (Safety)	**EA**	**4**	**5000**	**$20,000**			$0		$0	$20,000
	EA			$0			$0		$0	$0
	LS			$0			$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$168,902	$0		$0		$0	$151,070
D. Protection/Safety										
Hazard TreeTreatment Trails	Miles	36	2446.9	$88,089						
Hazard Tree Treatment Roads	ea	1	8706	$8,706						
Hazard TreeTreatment-FNF	ea	1	11706	$11,706						
Trail Head Signs	EA	8	80	$640						
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$109,141	$0		$0		$0	$0
E. BAER Evaluation										
Team evaluation	EA	1	25000	$25,000	$25,000		$0		$0	$25,000
	EA			---	$0					
Insert new items above this line!				---	$0		$0		$0	$0
				$25,000	$25,000		$0		$0	$25,000
F. Monitoring										
Noxious/Invasive Detection	miles	67	135	$9,045	$0		$0		$0	$9,045
Noxious/Invasive Detection FNF	Miles	9	102	$918						
Local review by 5 specialists	LS	1	3000	$3,000	$0					
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$12,963	$0		$0		$0	$0
G. Totals				$354,472	$25,000		**$0**		**$0**	**$199,945**
Previously approved										
Total for this request				$354,472						

PART VII - APPROVALS

1. /s/ Lesley Thompson 9/11/07
Forest Supervisor (signature) Date

2. _____ _____
Regional Forester (signature) Date



Attachment:

BAER Values at Risk Report

David Calkin, PhD, Research Forester, 9/5/07
U. S. Forest Service
Rocky Mountain Research Station, Missoula, MT

The BAER assessment for the three fires within the Lewis and Clark complex (Ahorn, Fool Creek and Skyland fires) applied a new Values at Risk (VAR) Calculation Tool developed by the Rocky Mountain Research Station. The tool was created to improve the economic assessment of the need for proposed treatments to protect the identified VAR, thus improving the selection and defensibility of proposed treatments. In developing this tool the authors surveyed BAER personnel to determine the effectiveness of economic analysis in the BAER assessment process. They found that three fundamental limitations compromise effective calculation of resource values-at-risk: 1) current valuation guidelines are unclear, 2) BAER team members typically have limited training and experience in the field of economics, and 3) data to support direct valuation of specific resources, particularly non-monetary resource values (e.g., sensitive wildlife species, undeveloped recreation, cultural artifacts), are not consistently available. These limitations to past assessments reduced the defensibility of proposed treatments.

Values at Risk Calculation Process

Terminology

Wildfire risk is defined as the product of the likelihood of an event of a given intensity (threat) times the net value change to the affected resource at the given intensity (For example, if there is a 0.50 probability that a post-fire flood containing suspended ash will destroy a $5,000 domestic water system, the monetized risk is $2,500). Risk based assessments require that *threat (the likelihood of experiencing an event)* be clearly differentiated from *risk* and from *values-at-risk* (VAR). Unless a valued resource is in harm's way there is only a threat, it poses no risk.

Application to the Lewis and Clark Fire Complex

At the outset of the BAER assessment process, VAR were identified and spatially coupled to probable threats. The probabilities of threats occurring as well as the probabilities of treatment success were estimated through the course of the BAER assessment using a team of specialists. The designers of the tool realize that assigning the probabilities of threat materializing can be difficult and are often based on expert opinion, and when possible informed by appropriate model runs.

The VAR tool applies a hybrid approach for assessing the economic efficiency of proposed treatments during post-fire assessments: 1) a probability-based Benefit Cost (B/C) analysis is used where monetary values are readily available and 2) an Implied Minimum Value (IMV) is assigned to estimate the efficiency of treatments related to non-monetary resources.

For these non-monetary resources, instead of directly assigning monetary values to non-monetary resources, a computation is used to derive a value of the resource needed to justify a proposed treatment. Implied Minimum Value equals the treatment cost divided by the reduction in likelihood of experiencing the negative outcome; the lower the IMV the easier the treatment justification:

$$\mathrm{IMV} = \left(\frac{\text{treatment cost}}{\text{Prob(loss occurring with no treatment)} - \text{Prob(loss occurring after treatment)}} \right)$$

The IMV does not necessarily represent the actual dollar value of the resource loss averted—in fact, the true monetary value need not be defined. IMV simply reflects that in the BAER team's opinion avoiding the damage to a threatened non-monetary value is worth at least the calculated implied minimum value, and therefore, the proposed treatment is a wise investment of public funds.

The new VAR tool was applied to each of the three fires separately. Individual results for each fire are described in analysis documents and above.