Date of Report: November 8, 2011

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[1]

A. Fire Name: 41 Complex Fire

B. Fire Number: MT-BRF-005402

C. State: MT

D. County: Ravalli

E. Region: R1

F. Forest: Bitterroot

G. Districts: Darby

H. Fire Incident Job Code: P1GDE1 0103

I. Date Fire Started: August 28, 2011

J. Date Fire Contained: not yet contained

K. Suppression Cost: $4.95 million

L. Fire Suppression Damages Repaired with Suppression Funds
1. **Fireline waterbarred (miles)**: 5 miles hand line repaired.
2. **Fireline seeded (miles):** 5 miles of handline seeded.
3. **Other (identify):**

M. Watershed Number: Fire burned parts of 6th-level watersheds 170102050901, 170102050902, 170102051004 and 170102050701

N. Total Acres Burned:
[15,199 total] NFS Acres [ ] Other Federal [ ] State [] Private

[1] 41 Complex is composed of the 41, Up Top, Coyote Meadows, and Fox Peak fires

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, Subalpine bunchgrass communities.

P. Dominant Soils: coarse to fine textured sandy loams

Q. Geologic Types: Bitterroot Mountain Range, Decomposed Granite and calc-silicate metamorphic parent types, Idaho Batholith

R. Miles of Stream Channels: All watersheds are within 4th-level watershed 17010205. Miles shown are within fire perimeter, NHD streams layer used.

6th-level Watershed	Stream Miles
0901	15
0902	1
1004	17
0701	6

S. Transportation System

Trails: 5.6 **miles** **Roads:** 34.0 **miles** within fire perimeter

PART III - WATERSHED CONDITION

A. Burn Severity (acres):
Unburned: 2,626 acres (34%) **Low:** 2,294 acres (15%) **Moderate:** 5,500 acres (36%) **High:** 2,181 acres 14%).

B. Water-Repellent Soil (acres): approx. 4,931 acres (all of high severity, 50% of moderate severity acres = 32% of area within fire perimeter).

C. Soil Erosion Hazard Rating (acres): 2,294 **(low)** 5,500 **(moderate)** 2,181 **(high**)

D. Erosion Potential: 7 **tons/acre**[2] (Normal precip, 14.25 t/ac for 10yr RI precip year)

E. Sediment Potential: 7 **tons/acre**[3] **(**4,480 **cubic yards / square mile,** assumes 1T/cu yd**)**

[2] Results derived from Disturbed WEPP. Modeled high intensity fire in the uplands and riparian, sandy loam soil, 30-50% slope, 20% ground cover , 25% rock, and Stevensville modified climate (MAP=35"). This is a worse case analysis.

[3] Results derived from ERMiT. Modeled high intensity fire, sandy loam soil, 25% 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): 5 and10 years

D. Design Storm Duration, (hours): 6 and 24 hours

E. Design Storm Magnitude, (inches): 1.2, 1.4 inches

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

G. Estimated Reduction in Infiltration, (percent): 25 - 70%, Varies with watershed

H. Adjusted Design Flow, (cfs per square mile): Varies with watershed size, topography and amount burned (see below). 5-yr RI post-fire storm flow was 16 cfs/sq mi, 10 RI post-fire storm flow was 44 cfs/sq mi – both are increases over pre-fire storm flows, which do not include base flow.

Post-fire flows were modeled using the NRCS-based Fire Hydrology V1.3 (Cenderelli) analysis tool for pre and post-fire conditions. Output is in peak flow rates (cfs), which includes baseflow plus the flow component that is attributable to the storm itself. For 5 and 10 year precipitation events in burned watersheds, stormflow varies with the percentage and severity of burned area. "Adjusted" (post fire) flows in 41 Complex Fire watersheds increased from near 0 to 187 cfs over pre-fire flow estimates, depending on storm return interval and watershed. Peak flows in 41 Complex Fire watersheds surpass existing channel culvert capacity in 1 location in modeling exercises (MT Hwy 38/Blade Creek crossing). Models such as this cannot address debris flows and floatable wood, which can cause culvert plugging and overtopping. Several treatment recommendations are based on the probabilty of this kind of event, rather than the potential for "typical" flood events.

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 Saddle Complex Fire Area, however, the following threats were deemed significant:**

1. Trail prisms/infrastructure – post-fire hydrology driven by high burn severity will increase risk of damage at 5.6 miles of system trails, with loss of trail prism and increased repair costs. These are moderate-use level trails that access unique areas in the Sapphire Mt. Range (Skalkaho Mt, Skalkaho Basin) that the Ranger District would like to keep for the long term.
   Post-fire hydrology will increase the occurance of surface runoff from burned slopes onto the trail prism. There is a risk of intensive trail gullying and rutting, which may cause extensive damage to the trail prism. There is also a risk of falling hazard trees for trail workers implementing prescribed treatments.
2. Previously weed-free areas within High/moderate burn severity – loss of competing vegetation due to the fire will enable progressive migration of road & trail side weeds into new areas. Freshly burned roadsides create an ideal highway for weed expansion.

   If untreated, the high severity of large parts of the burn, and the large percentage of dry habitat types in the burn area result in a high probability that existing noxious weed populations will expand dramatically, and displace native plant communities. This risk is primarily on the south and west aspects of the fire (where the dry habitat types are concentrated), along with areas subjected to high-intensity fire that consumed the duff layer and increased the native vegetation recovery period.

B. Emergency Treatment Objectives (narrative):

a. **Protect trail infrastructure from surface flows, reduce stream capture and maintain access;**
b. **Reduce the threat of significant expansion of existing noxious weeds or invasion of new noxious weeds;**
c. **Protect trail workers from hazard trees.**

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

Land NA **Channel** NA **Roads/Trails** 85**%** **Protection/Safety** 95**%**

D. Probability of Treatment Success

	Years after Treatment		
	1	**3**	**5**
Land			
Noxious weed treatment	80	75	70

Noxious weed monitoring	85	NA	NA
Roads/Trails			
Trail Waterbar Installation	85	90	95
Protection/Safety			
Worksite Haz Tree Felling	95	85	80

E. Cost of No-Action (Including Loss): See attached Cost-Risk Analysis Document

F. Cost of Selected Alternative (Including Loss): See attached Cost-Risk Analysis Document

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology	**[X] Soils**	**[ ] Geology**	**[X] Range**
[X] Forestry	**[ ] 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	Ed Snook (SO, BNF)
Soil Scientist	Cole Mayn (SO, BNF)
Fisheries	Rob Brassfield (D-1, BNF)
Botany	Robin Taylor-Davenport (SO, BNF)
GIS	Erin Nock SO, BNF
Engineering/Roads	Jim Stuart (SO, BNF), Rich Raines (SO, BNF)
Heritage	Mary Williams (SO, BNF)
Fiscal Mgmt/Purchasing	Cheryl Andersen (SO, BNF), Tina Mainey(SO, BNF)
Recreation/Trails	Marty Almquist, Charley Mabbot, Deb Gale (D4 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:

Noxious Weeds Control/Treatment

Objective:
The purpose of the treatment is to maintain ecosystem integrity within the 41 Complex Fire Area (Skalkaho Basin), where few noxious weed populations exist. Without treatment knapweed and other new invaders may spread into the severely burned areas. By reducing the amount of weed seed along roads, dozer lines & trails in the area, native species will have an opportunity to take advantage of the post-fire nutrient flush without competition from noxious weeds.

Methods:
As monitoring indicates, treat fire access road corridors that provide routes invasive weed species could use to expand into the severely burned areas with aminopyralid or Escort. Selected sites include spraying along roads including, but not limited to, FR714, FR1363, FR1365 and FR1358 where heavy canopy loss has increased the risk of knapweed and other species spreading into the burned area. Effects of herbicide treatments at the proposed rates using aminopyralid, clopyralid or picloram are addressed in the Bitterroot National Forest Noxious Weed Environmental Assessment, and all implemented treatments would be consistent with this document. New invaders and previously weed-free areas would be targeted.

Channel Treatments:

In-Channel Tree Felling
Objective:
Trap floatable debris and suspended sediment; reduce potential in-channel debris flow bulking above crossing with potential for debris jamming. Provide cover for fish and improve channel stability in the road crossing vicinity.

Methods:
Treat Gird Creek upstream of FR1365 road crossing, and two un-named tributaries of Daly Cr upstream of Hwy 38 road crossings, starting approximately 100 yards upstream, directionally fell trees upstream into channel in an overlapping herringbone pattern. Utilize trees large enough to resist downstream transport, and green trees where possible. Treat 2-3 locations on each channel.

Trail Treatments:

Install Trail Waterbars
Objective
Approximately 5.6 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. Affected trails include: TR86 (Skalkaho Mt, 3.3 mi.), TR159 (Divide Cr., 1.4 mi.), TR149 (Skalkaho-Little Burnt Fork, 0.9 mi).
Total: 5.6 miles.

Methods
The method for reducing this risk is limited to installing water bars, which would be used to direct and divert flow off the trail. These treatments would reduce the risk of the trail washing out and transporting sediment to streams. Proactive treatment would be cheaper than remediation after damage.

Road Treatments:

None

Protection/Safety Treatments:

Fell Hazard Trees around Work Sites

Objective

Protect BAER implementation workers at sites with hazard trees.

Methods

Use certified sawyers in crews to fell hazard trees threatening workers at identified sites. Use Agency snag assessment and falling methods. If tree is unsafe to fall, re-assess treatment need, methods or utilize excavator to fall tree. Costs of this activity are included in the *Install Trail Waterbar treatment.*

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.)

Noxious Weed Monitoring

Objective:

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 native plant community protection objectives are being met.

Methods :

During 2012, monitor effectiveness of the spraying and establishment of new weed populations. Accurately map new populations using GPS and GIS. Establish photo plots for potential treatment. Monitor weed treatments results to ensure objectives are being met Accurately map any new populations using GPS. Establish photo plots for documentation as needed.

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

			NFS Lands				Other Lands				All
		Unit	# of		Other		# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$		units	$	Units	$	$
A. Land Treatments											
Weed Spray	acres	240.61	13	$3,128	$0			$0		$0	$3,128
					$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Land Treatments				$3,128	$0			$0		$0	$3,128
B. Channel Treatments											
Directional Felling	site	421.93	3	$1,266	$0			$0		$0	$1,266
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Channel Treat.				$1,266	$0			$0		$0	$1,266
C. Road and Trails											
Install Trail Waterbars	miles	1974	5.6	$11,054	$0			$0		$0	$11,054
					$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Road & Trails				$11,054	$0			$0		$0	$11,054
D. Protection/Safety											
					$0			$0		$0	$0
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Structures				$0	$0			$0		$0	$0
E. BAER Evaluation											
Saddle Complex	lump	$9,410	1	$9,410				$0		$0	$0
Insert new items above this line!				---	$0			$0		$0	$0
Subtotal Evaluation				$9,410	$0			$0		$0	$0
F. Monitoring											
Weed Monitor	acres	6.47	2433	$15,742	$0			$0		$0	$15,742
Insert new items above this line!				$0	$0			$0		$0	$0
Subtotal Monitoring				$15,742	$0			$0		$0	$15,742
G. Totals				$40,600	$0			**$0**		**$0**	**$31,190**
Previously approved											
Total for this request				**$40,600**							

PART VII - APPROVALS

1. _____ _____
Forest Supervisor (signature) Date

2. _____ _____
Regional Forester (signature) Date

Saddle Complex MT 2011
Cost/Risk Assessment

Part 1. Treatment Cost

Treatment		cost
1.	Weed Treatments	$3,128
2.	Channel – Directional Felling	$333
3.	Trail Waterbars	$11,054
4.	New Invasive Weed Monitoring	$15,742
TOTAL COST		$30,257

Part 2. Probability of Rehabilitation Treatments Successfully Meeting EFR Objectives

Treatment	%
1. Weed Treatments	80
2. Channel – Directional Felling	85
3. Trail Waterbars	85
4. New Invasive Weed Monitoring	90

Risk of Resource Value Loss or Damage

Identify the risk (high, medium, low, none or not applicable (NA)) of unacceptable impacts or loss of resources.

No Action- Treatments Not Implemented (check one)

Resource Value	None	Low	Mid	High
Human health and safety		X		
Trail structure and investments				X
Plant communities at-risk from weed infestation				X
Native Plant community structure, function and composition		X		
Aquatic community structure, function and composition			X	
Watershed integrity		X		
Heritage resources		X		
Threatened and Endangered Species (terrestrial)		X		
Threatened and Endangered Species (fish)			X	

Proposed Action - Treatments Successfully Implemented (check one)

Resource Value	None	Low	Mid	High
Human health and safety		X		
Trail structure and investments		X		
Plant communities at-risk from weed infestation			X	
Native Plant community structure, function and composition		X		
Aquatic community structure, function and composition			X	
Watershed integrity		X		
Heritage resources		X		
Threatened and Endangered Species (terrestrial)		X		
Threatened and Endangered Species (fish)			X	

Part 3. SUMMARY

1. **Are the risks to natural resources and private property <u>acceptable</u> as a result of the fire if the following actions are taken?**

Proposed Action Yes |_X_| No |__| Rationale for answer:

The road/stream crossing structure on Gird Creek is a recent fish-passage/AOP design, but post-fire debris jams have damaged other new structures on the Forest, and the inexpensive directional felling treatment can act as a "trash rack" to reduce floating woody debris and the potential for expensive repairs at this remote site.

The trail drainage treatments (trail waterbars) proposed are effective in stabilizing trails against post-fire hydrology. Many native log waterbars have been burned to the point of failure. The treatments will be effective in draining surface flows off of trail prisms, reducing trail incision and potential for stream capture. Incised trails have proven to be almost impossible to recover or restore, and trail waterbars have proven effective in reducing trail erosion and stream capture.

Major weed invasions can be avoided through early detection, treatment, and monitoring. Several species found along roads (spotted knapweed, cinquefoil) have the potential to disrupt and replace currently intact native plant communities in the Skalkaho Basin/Skalkaho Mountain area. Road and trail systems within the burn area are potential corridors of invasion, and can be effectively monitored and treated.

No Action Yes |__| No |_X_| Rationale for answer:

Trails within the fire perimeter are a valued recreational resource and would be subject to post-fire hydrology and erosion without treatment. Incised trails often require either extensive work or relocation to be functional and meet USFS standards, so proactive trail drainage work would save funding in the long run.

Native plant communities, including rare and threatened plant species, would be subject to non-native invasive plant expansion into the burned area while native plants are recovering from the fire.

The areas selected for treatment have a high risk of negative impacts to soil, water and vegetation resources.

Alternative(s) Yes |__| No |__| Rationale for answer:

N/A

2. Is the probability of success of the proposed action, alternatives or no action acceptable given their costs?

Proposed Action Yes |_X_| No |__| Rationale for answer:

The potential for surface flow on trails will be greatly reduced with the repair of burned waterbars within fire-affected slopes. With trail erosion reduced, more expensive repairs can be avoided in the long term. Directional felling is also a proactive treatment that reduces the potential for more expensive repairs in the long term.

Data obtained in the monitoring programs proposed will detect weed invasion early for best chance of success in treatment.

The beneficial results of treatment implementation are worth the monetary costs of installation.

No Action Yes |__| No |_X_| Rationale for answer:

Although the monetary cost of no action is low, weed invasion will produce ecological costs. Risk of several new noxious/invasive weed species establishing themselves in the burned area is high. Not repairing waterbars on trails will drastically increase the chances for trail damage, which can be difficult to repair given their remote locations.

Alternative(s) Yes |__| No |__| Rationale for answer:

N/A

3**. Which approach will most cost-effectively and successfully attain the EFR objectives and therefore is recommended for implementation from a Cost/Risk Analysis standpoint?**

Proposed Action |_X_|, Alternative(s) |__|, or No Action |__|

Comments: