MUSTANG COMPLEX FIRE

FS-2500-8
BURNED-AREA REPORT

BITTERROOT NATIONAL FOREST

INITIAL FUNDING REQUEST (R1)
November XX, 2012

Date of Report: **12/0312**

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

From BARC analysis 9/7/2012 Image

A. Fire Name: Mustang Complex (Idaho portion)
B. Fire Number: ID-SCF-012190

C. State: Montana
D. County: Ravalli

E. Region: 1
F. Forest: Bitterroot National Forest

G. District: West Fork
H. Fire Incident Job Code: P4G4A0 (0413)

I. Date Fire Started: July 30, 2012
J. Date Fire Contained: 11/05/12

K. Suppression Cost: $38,323,413

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 2.5
2. Fireline seeded (miles): 5.5
3. Other (identify): 32 miles bladed closed road prism re-bladed & seeded

M. Watershed Number:

HUC_12	HUC_12_NAME
170102050102	W Fk Bitterroot River-Beaver Creek
170102050103	Hughes Creek
170602030605	Hughes Creek (Idaho)
170602030703	Indian Creek
170602030704	Squaw Creek
170602030801	Spring Creek

170602031301	Owl Creek
170602070101	Upper Horse Creek
170602070103	Middle Horse Creek
170602070105	West Fork Horse Creek
170602070106	Lower Horse Creek
170602070206	Little Squaw Creek-Salmon River
170602070401	Hamilton Creek
170602070402	Upper Sabe Creek
170602070403	Lower Sabe Creek
170602070501	Big Squaw Creek
170602070502	Big Bear Creek-Salmon River
170603010101	Swet Creek-Selway River
170603010102	Wilkerson Creek
170603010103	Hells Half Acre Creek-Selway River

N. Total Acres Burned: **92,266** acres* NFS Acres (Other Federal (0) State (0) Private (xx)
**This report considers only the acres burned on the Bitterroot National Forest using 10/3/12 fire perimeter. The final FSH5109.14 report shows 275,960 total acres for the fire, which burned extensive areas in Idaho.*

O. Vegetation Types: The fire area spans many vegetation types. Forested areas include Ponderosa Pine, Douglas Fir, Lodgepole Pine, and Subalpine Fir. Non-forested areas include Mountain Mahogany, Sagebrush, and Bunchgrass.

P. Dominant Soils: The upper West Fork Bitterroot River area includes steep, highly dissected landforms with highly erodible soils. Soils within this area are moderately deep, coarse-textured sandy loams with high rock fragment content. Source areas are mostly granitic, with some areas of quartzite.

Q. Geologic Types: Granitics, Metamorphics, Quartzites

R. Miles of Stream Channels by Order or Class: Perennial: 222 Intermittent: 70

S. Transportation System
Trails: 21.5 miles open non-motorized, system
Roads: 3.6 miles open system

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 71,076 (low and unburned within fire perimeter*) 12,573 (moderate) 8,822 (high) Combined with Low Severity (Unburned / no data)
** An error in the satellite sensor created strips of no data in the 9/7/12 imagery. These strips are indistinguishable from unburned areas in the imagery.*

B. Water-Repellent Soil (acres):8,822*
** This figure is reported as the area of high burn severity.*

C. Soil Erosion Hazard Rating* (acres): 71,076 (low) 12,573 (moderate) 8,822 (high)
**Acres are based on the Landtype Erosion Hazard attribute in the Landtypes GIS database.*

D. Erosion Potential: 10 – 15 tons/acre

E. Sediment Potential: 4700 – 7100 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 3-5 yrs grasses, 5-8 yrs shrubs, 50-80 yrs trees

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): 4-6 cfsm

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

H. Adjusted Design Flow, (cfs per square mile) 110 cfsm[1]

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats: No downstream threats to life from storm events were found in the Mustang Complex Fire Area, however, the following threats were deemed significant:

General Description

1. 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. New Invader to Montana present upwind in Idaho (Rush Skeletonweed). The large amount of bare ground caused by the severe burn creates an opportunity for new invasion by weed species not previously found in the Upper West Fork. 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 within 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.

   The Mustang Complex Fire has burned in a mosaic pattern with a full range of burn intensities from very high to unburned in discontinuous patches. Invasive plant species present a concern with respect to the goal of retaining native plant communities in order to maintain the structure and function of the local ecosystem. Most of the invasive plant species that occur within the fire perimeter are well-adapted to fire. These species respond favorably to fire events and often spread rapidly after fire. The invasive plant species identified in the fire area listed on the Ravalli County (Montana) Invasive Species List, Idaho statewide containment list, Idaho statewide control list, and/or Lemhi County Cooperative Weed Management Area (CWMA) invasive list are shown in **Table 1**. Values at-risk from the invasion of new invasive/noxious species and rapid expansion of established invasive/noxious species include:
   a. Loss of native specie biological diversity and ecological stability on both public and private lands;
   b. Loss of healthy native plant communities currently dominant in weed-free areas will result from invasives encroachment within the fire perimeter;

[1] 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

c. Interference by invasive/noxious weeds with the natural regeneration of native plant communities affected by the burn;
d. Loss of critical big game and bighorn sheep (sensitive specie) foraging habitat throughout the fire affected area by new and/or expanded invasive weed infestations in timbered and open habitat types;
e. Loss of upland soil stability and productivity on open timber and grass/shrub habitat types that typically accompanies invasive/noxious weed infestations.
f. Loss of previous investments and gains in invasive/noxious weed control made by RAC grants, Rocky Mountain Elk Foundation grants, National Fish and Wildlife Foundation grants, Cooperative CD Barrier Zone Project monitoring/treatment work, numerous biocontrol releases in cooperation with the Western Agricultural Research Center (MSU), BNF appropriated fund project work, and cooperative work with the Salmon-Challis National Forest and Lemhi County, Idaho.

2. Trail prisms/infrastructure – post-fire hydrology driven by high burn severity will increase risk of damage on 22 miles of system trails within moderate and high severity burn, with resulting loss of trail prism and waterbars. These are moderate-use level trails that access unique areas in the Selway-Bitterroot Wilderness Area that the West Fork 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 high risk of intensive trail rutting and stream capture, which causes extensive damage to the trail prism if it occurs. Without treatment,concentrated flow diverrted down the trail tread may induce gully cutting and reduce downstream water quality. Proactive treatment of fire-affected trail segments would be cheaper than remediation after damage. There is also a risk of falling hazard trees for trail workers implementing prescribed drainage and stabolization treatments.

Native Plant Communities and Invasives - Details

The invasive plant species identified in the fire area listed on the Montana and Ravalli County Invasive Weeds List, Idaho statewide containment list, Idaho statewide control list, and/or Lemhi County Cooperative Weed Management Area (CWMA) invasive list are shown in **Table 1**. Idaho lists are included as weed control in the Mustang Complex Fire area will be a coordinated effort with the Salmon-Challis NF.

Table 1: Invasive plant species present in the area burned by the Mustang Complex fire.

Target Invasive Weed Species with Potential to Colonize Burned Areas in the First Post-Fire Year	Montana and Ravalli County, MT Invasive List	Idaho Statewide containment list	Idaho Statewide control list	Lemhi County, ID CWMA Invasive List
Spotted knapweed	X	X		X
Sulphur cinquefoil	X			X
Rush skeletonweed *	X	X		X
Hoary alyssum *	X	X		X
Canada thistle	X	X		X
Houndstongue	X	X		X
Common St. Johnswort	X			X
Dalmatian toadflax	X	X		X
Knotweed	X		X	X
Oxeye daisy *	X	X		X
Puncturevine	X			X

* denotes species of highest priority for first year post-fire detection and treatment for the Bitterroot NF

Much of the Salmon River Breaks area on the Bitterroot NF burned by the Mustang Fire is relatively free of invasive weeds but is now highly susceptible to exotic plant invasion due to habitat types, exposure and fire disturbance frequency. Scattered infestations of spotted knapweed, sulfur cinquefoil, oxeye daisy and houndstongue are also present in intermittent pockets and along the trail system. These species are also poised for rapid expansion into fire disturbed sites.

The potential for establishment and spread of invasive plant species in the burn area is very high. The prevailing wind pattern (southwest) of the region is perfectly aligned to carry the windborne seeds of rush skeletonweed in a north/northeast direction and deposit them in the ideal seedbeds created by the fire. In addition, the fire consumed portions of the physical vegetative timber / shade and surface litter barriers that normally would reduce significantly the opportunities for germination of the invading rush seeds. Many known, mapped infestations that could serve as source areas are found within the fire perimeter along or near roads within the upwind areas of the Salmon-Challis NF.

There are, however, other vectors as well for weed seeds, including domestic cattle, wildlife species, wind and water. In the case of rush skeletonweed, wind is a primary vector. Another species, sulphur cinquefoil, is spread by rodents and small birds. Sulphur cinquefoil spreads rapidly and is highly competitive; it can even out-compete spotted knapweed and has no forage value to wild ungulates. These two species, rush skeletonweed and sulphur cinquefoil, have a very high potential for disrupting native plant community re-establishment in areas otherwise uninfested by noxious weeds.

The combination of known weed species' presence and invasive capabilities with the vulnerable post fire condition of the soil and vegetation resources puts the recovery of native plant communities within the burn area at a high risk. Table 2 (below) displays the Risk Rating to invasion of native or naturalized communities by each of the weed species presently known to occur within the Mustang fire area. Trail erosion risk within high and moderate severity burn is also included in Table 2.

Please see the attached letter of support from the Montana State University Agricultural Experiment Station project leader of the Continental Divide Invasive Weed Barrier Zone, which includes the Mustang Complex Fire area.

Table 2. Risk Assessment for Mustang Complex

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Rush Skeletonweed, Sulphur Cinquefoil spread = **Very High**	Untreated Trail Erosion, Spotted Knapweed spread = **Very High**	Canada Thistle = **Low**
Likely	Houndstongue, Knotweed, Oxeye Daisy spread = **High**	Common St. Johnswort, Hoary Alyssum = **High**	**Low**
Possible	Leafy Spurge, Puncturevine spread = **High**	Dalmatian Toadflax, Yellow Toadflax spread = **Intermediate**	Musk Thistle = **Low**
Unlikely	Diffuse Knapweed spread = **Intermediate**	Low	Henbane = **Very Low**

B. Emergency Treatment Objectives:

- **Protect trail infrastructure from flood flows, debris torrents, and other potential events and maintain access;**
- **Reduce the threat of significant expansion of existing noxious weeds or invasion of new noxious weeds;Locate and treat new invasive plant species infestations during early stages of spread in ecologically sensitive burned areas in order to maintain the structure and function of the local ecosystem.**
- **Protect trail workers from hazard trees.**
- **Inform the public of burned area hazards using trailhead signs.**

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

Land **75** % Channel **NA** % Roads/Trails **80** % 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			
Trailhead Hazard Signs	95	85	80

E. Cost of No-Action (Including Loss): See Cost-Risk Analysis and Matrix p. 12

F. Cost of Selected Alternative (Including Loss): See Cost-Risk Analysis and Matrix p. 12

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Ed Snook
Bitterroot National Forest
1801 N. 1st St, Hamilton, MT 59840

Email: esnook@fs.fed.us Phone: (406)363-7103 FAX: (406)363-7106

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 Mustang Complex Fire Area (Upper West Fork Bitterroot River), where few noxious weed populations exist. Without treatment rush skeletonweed and other new invaders may spread into the severely burned areas. By reducing the amount of weed seed 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 routes including, but not limited to, Forest Roads 5677, 5685, 13889, and 5684 where road surface disturbance and heavy canopy loss has increased the risk of rush skeletonweed, knapweed and other species spreading into the burned area. Trails listed under trail treatments would also receive priority. Newly discovered infestations would receive a high priority for treatment under the EDRR strategy. 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.

The selection of herbicide, application rate, and time of application will be based on specific weeds being treated, access to the locations of areas where weeds may occur and plant phenology at the time of treatment. The application rates and spraying method would depend on the abundance of the target species, condition of non-target vegetation, soil type, depth to the water table, the distance to open water sources, riparian areas, special status plants, and requirements of the herbicide label. Applications would be scheduled and designed to minimize the potential impacts to non-target plants. Monitoring of treated sites would determine treatment efficacy and the need for follow-up treatments. Monitoring would identify whether treatment methods needed to be changed or if a more effective herbicide should be used. Proposed monitoring of treated sites will locate new infestations.

Channel Treatments: N/A

Roads and Trail Treatments:

Install Trail Waterbars

Objective:

Approximately 22 miles of trail are within high and moderate burn severity and 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 staying on the trail. The trails drainage system was 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 burned water bars may cause stream capture onto trail surface area causing soil erosion, including loss of the trail by rilling and gullying. Trails affected by high and moderate severity burn include: #'s 18, 29, 114, 6, 17, 65, 9, 113, 28, 96, 4.4, 19, 30, 67, 69, 66, 25, 11, 575, and 31. Please reference the trails treatment specification sheet for the fire for more information.

Methods:
The method for reducing this risk is focused on installing water bars or outslope sections, which would be used to direct and divert flow off the trail. Some trail segments may require tread stabilization to facilitate the proposed drainage structures. These treatments would reduce the risk of the trail washing out, stream capture and increased sediment to streams.

Protection/Safety Treatments:

Install Trail Warning Signs

Objective:
Inform the public of potential post-fire risks to trail user safety. These include hazard trees, stump holes, eroded trail surfaces and unstable tread.

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 2013, monitor effectiveness of the spraying and establishment of new weed populations. Perform Early Detection Rapid Response to locate new and known minor populations of invasive plant species' infestations during early stages of spread in ecologically sensitive areas in order to maintain the structure and function of the local ecosystem. 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.

EDRR activities will begin at known weed infestations and then radiate out from these epicenters to detect, map and treat new infestations. Crews will be trained to recognize and look for new invaders as well that may have been vectored into the burn area by fire suppression crews. This approach served well for Salmon-Challis NF BAER efforts after the 2007 Clear Fire in lower Panther Creek, when an astute crew member found and reported infestations of salt cedar establishing in the riparian area along Clear Creek.

An Invasive Plant monitoring plan was developed and is available for review. Contact Ed Snook, BNF BAER Coordinator for a copy.

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

			NFS Lands				Other Lands			
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	**Units**	**Cost**	**Units**	**BAER $**	**$**	**units**	**$**	**Units**	**$**	**$**
A. Land Treatments										
Invasive Weed Treatm	Acres	$119	520	$61,880						
Insert new items above this line!				$0			$0		$0	$0
Subtotal Land Treatments				$61,880	$0		$0		$0	
B. Channel Treatments										
Insert new items above this line!				$0			$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
Trail Waterbar/Haz Tre	miles	$1,500	22	$33,000						
										$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$33,000	$0		$0		$0	
D. Protection/Safety										
Trail Warning/Haz Sign	each	$250	4	$1,000						
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$1,000	$0		$0		$0	$0
E. BAER Evaluation (Est total as of 11/30/12)										
Assessment Total	each	$3,200	1		$3,200					
Insert new items above this line!					$0		$0		$0	$0
Subtotal Evaluation					$3,200		$0		$0	
F. Monitoring										
Invasive species Monit	acres	$9.83	2000	$19,660	$0					
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$19,660	$0		$0		$0	
G. Totals				$115,540	$3,200		**$0**		**$0**	
Previously approved										
Total for this request				**$115,540**	$3,200					

PART VII - APPROVALS

1 _____

Forest Supervisor (signature) Date

2. _____ _____

Regional Forester (signature) Date

Attachement A:
Mustang Complex MT 2012
Cost/Risk Assessment

Part 1. Treatment Cost

Treatment		cost
1.	Weed Treatments	$62,084
2.	Install Trail Waterbars	$33,005
3.	Install Trail Warning/Safety Signs	$1,000
4.	New Invasive Weed Monitoring	$19,660
TOTAL COST		$115,749

Part 2. Probability of Rehabilitation Treatments Successfully Meeting EFR Objectives

Treatment		%
1.	Weed Treatments	80
2.	Install Trail Waterbars	85
3.	Install Trail Warning/Safety Signs	90
4.	New Invasive Weed Monitoring	85

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	
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		
Plant communities at-risk from weed infestation			X	
Plant community (PIPO; PIMO) 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:
Major weed invasions can be avoided through early detection, treatment, and monitoring. Several species that exist in the Salmon River Valley (Rush Skeletonweed, Dalmation Toadflax, others – see narrative above) are not present within the Mustang Complex burned area and have the potential to disrupt and replace currently intact native plant communities. Road and trail systems within the burn area are potential corridors of invasion, and can be effectively monitored and treated.

Hazard tree identification, mitigation, and monitoring will reduce the threat to BAER implementation worker safety, with an indirect benefit of reducing risk to the public.

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, stream capture, and incision.

No Action Yes |__| No |_**X**_| Rationale for answer:
Large areas of native plant communities would be subject to non-native invasive plant expansion into the burned area while native plants are recovering from the fire. Without emergency funding, weed detection and treatment would be severly compromised, creating a high risk that new invasive species would become established in roadless and designated Wilderness areas prior to control funding obtainment through normal channels.

There is a high probability of trail prism failure in high and moderate burn severity areas if no action is taken, creating a need for expensive repairs including hauling of fill from off-site to replace that lost during hydrologic events. Trails within the fire perimeter are a valued recreational resource (and economic resource for permitted outfitters) 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. Relocating trails in Wilderness settings is also problematic.

The areas selected for treatment have a high risk of negative impacts to soil, water, fisheries/aquatic, trails/recreation 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 probability for invasion of weed species not currently found in the Mustang Complex fire area will be substantially reduced with the availability of emergency funding to support monitoring and treatment of new invaders.

The potential for surface flow and stream capture on trails will be greatly reduced with the repair of burned waterbars within fire-affected slopes. With trail erosion and stream capture reduced, more expensive repairs can be avoided in the long term.

Burned area hazard signs effectively and cheaply provide information to travelers unfamiliar with the risks associated with burned areas.

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 long-term ecological costs. Risk of several new, aggressive noxious/invasive weed species establishing themselves in the burned area is increased without emergency treatment and monitoring funds, which would increase ecological damage and weed control costs in the future.

Trail degredation by post-fire hydrology is likely without treatments, and since the Ranger District plans on keeping the trail segments proposed for treatment open, more expensive repairs would likely be needed later.

Trail hazard warning signs are inexpensive and can provide important information to trail users unfamiliar with fire effects.

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: