

USDA-FOREST SERVICE
FS-2500-8 (7/00)

Date of Report: September 26, 2003

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

- ☒ 1. Funding request for estimated WFSU-SULT funds
- ☐ 2. Accomplishment Report
- ☐ 3. No Treatment Recommendation

B. Type of Action

- ☐ 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation 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: Hopeful 2
- B. Fire Number: P18527
- C. State: Idaho and Montana
- D. County: Clearwater and Missoula
- E. Region: Northern
- F. Forest: Clearwater and Lolo
- G. District: Powell and Missoula
- H. Date Fire Started: August 8, 2003
as of September 26, 2003.
- I. Date Fire Contained: Not contained
- J. Suppression Cost: \$17,463,219¹
- K. Fire Suppression Damages Repaired with Suppression Funds

¹ Includes costs for Beaver Lakes, Siah Lake, Wendover, and Bears Oil. The Lolo portion of the Hopeful II Fire was \$2,720,619. The Clearwater portion of these fires is \$14,720,600.

1. Fireline waterbarred (miles): 15.3 Miles (4.5 Miles of dozer line and 10.8 Miles of hand line obliterated).

2. Fireline seeded (miles): None

3. Other (identify): None

L. Watershed Number: Upper Crooked Fork Creek (19,481 Acres) 170603030101 (Idaho) and Granite Creek 170102051403 (Montana)

M. Total Acres Burned: 3509 Acres

NFS Acres(**2887**) Other Federal (0) State (0) Private (**622**)

N. Vegetation Types: Vegetation data was only available for the Clearwater NF portion of the Hopeful 2 fire. Field observations show that the fire area is dominated by high elevation forest cover types. Estimates from the TSMRS (Timber Stand Management Record System) database indicate the following cover types were present within the burn perimeter prior to the fire: subalpine fir (39.2%), lodgepole pine (31.5%), Douglas-fir (13.0%), Engelmann spruce (8.9%), other (6.2%), nonstocked (1.3%). Portions of the fire in Montana occurred on the Lolo NF and lands owned by Plum Creek Timber Company. Vegetation types on these areas to similar to those observed on the Clearwater NF.

O. Dominant Soils and Landforms: The fire area is dominated by a variety of soil types on high elevation broadly rounded mountain uplands, frost-churned slopes, alpine icecap basins, and high elevation stream terraces and outwash valleys. Soils are shallow to moderately deep loams, sandy loams, and silt loams with moderate to high levels of gravel, cobbles, and boulders. Soils are primarily Inceptisols with weak horizonation and little incorporation of organic matter. Rock outcrops are common on higher peaks and mountain slopes. Silt loams derived from the Mazama volcanic ash layer are present throughout much of the fire area, ranging in thickness from absent to approximately 10 inches in depth. Ash thickness declines east of the Bitterroot Divide in Montana and surface soil textures are considerably coarser.

P. Geologic Types: The fire area is underlain by Lolo Batholith granitics (87.9%), volcanics (11.3%), and alluvium (0.8%). The Mazama volcanic ash layer covers much of the area, particularly on the Idaho portion.

Q. Miles of Stream Channels by Order or Class:

Clearwater:	1 st Order = 3.30 Miles
	2 nd Order = 0.03 Miles
Lolo	2.94 Miles
Total	6.27 Miles

R. Transportation System

Trails: 1.42 miles Roads: 12.78 miles (Clearwater 2.44 Miles; Lolo 4.04 Miles; Plum Creek 6.30 Miles)

PART III - WATERSHED CONDITION

A. Burn Severity (acres): **Unburned:** 1112 Acres (31.7%); **Low:** 1246 Acres (35.5%); **Moderate:** 648 Acres (18.4%); **High:** 505 Acres (14.4%). Burn severity by ownership revealed that 18.4% of NFS lands were unburned, 40.2% burned with low severity, 20.4% burned with moderate severity, and 21.0% burned with high severity. On Plum Creek Timber Company lands, 60.8% was unburned, 28.6% in the low severity class, 9.4% burned in the moderate severity class, and 1.2% burned in the high severity class.

B. Water-Repellent Soil (acres): 829 acres (23.6%)

C. Soil Erosion Hazard Rating (acres): See attached maps.

Mass Wasting Potential: Low – 2583 Acres (73.6%); Mod. – 912 Acres (26.0%); High – 13 Acres (0.3%).

Debris Avalanche Potential: Low – 2135 Acres (60.9%); Mod. – 1362 Acres (38.8%); High – 11 Acres (0.3%).

Surface Erosion Potential: Low – 585 Acres (16.7%); Mod. – 1130 Acres (32.2%); High – 1793 Acres (51.1%).

Fire Erosion Potential: Low – 1354 Acres (38.6%); Mod. – 2085 Acres (59.4%); High – 69 Acres (2.0%).

Sediment Delivery Potential: Low – 1451 Acres (41.4%); Mod. – 1449 Acres (41.3%); High – 608 Acres (17.3%).

D. Erosion Potential: 34.1 tons/acre¹

E. Sediment Potential: 21,800 cubic yards / square mile¹

¹ Results are from Disturbed WEPP. Modeled high severity fire in the uplands and riparian; 20-45% slope; 20-45% ground cover; 0-10% rock; Fenn modified climate. This is a worse case analysis. Most of the fire will have no increase in erosion or sediment.

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):

The effects of the Hopeful 2 fire on recovery of vegetation within its boundaries will vary primarily by the severity of the burning that took place and the available seed sources. In undisturbed soil areas, the native seedbank for shrubs, forbs, and grasses will likely respond favorably to the burn since they have evolved with such natural disturbances. Where the soil has been altered, primarily by road construction, spread of noxious weeds is a concern that should be monitored over time. Slope, aspect, fuel loadings, and the type of vegetative cover present when the fire burned influenced the severity of the burn.

Unburned to Low Severity Burn Areas: In areas where the burn severity was unburned to low, recovery would generally be expected to occur within one growing season. Vegetative recovery is considered to be any vegetation which providing more than 80% cover which effectively intercepts rainfall and provides an extensive root mass as defined on page II-26 of the Clearwater National Forest Plan. These unburned to low severity burn areas are expected to maintain adequate live tree stocking levels and associated understory vegetation in most cases. Tree mortality is expected to average less than 30% in these areas, ranging from 0% to 50%. Perennial grasses, forbs, and shrubs generally will resprout after low severity burns and a duff/litter layer will reform within several years. Tree planting may be planned for many areas on National Forest System Lands where fire has killed significant areas of the live tree cover, but it is unknown whether tree planting will occur on private lands. All areas on National Forest System (NFS) lands requiring tree planting will have trees established and free to grow within five growing seasons. Vegetative recovery will vary from 0 to 5 years.

Moderate Severity Burn Areas: In areas where the burn severity was moderate, the majority of the trees are expected to die as a direct result of the fire, with mortality ranging from 50% to 100%. Most of the needles remain on the trees, but have turned red as a result of the burn effects. Tree planting will likely occur on National Forest System Lands, but it is unknown whether tree planting will occur on private lands. All areas requiring tree planting on National Forest Lands will have trees established and free to grow within five growing seasons. Vegetative recovery will vary from 1-15 years. Some of the larger areas that burned at moderate severity are a greater distance from surviving seed sources. This will slow the recovery time. Existing seed from shrubs, forbs, and grasses stored deeper in the soil, will provide some vegetative recovery in these areas

High Severity Burn Areas: In areas where the burn severity was high, nearly all of the trees were killed or are expected to die as a direct result of the fire, with mortality ranging from 80% to 100%. Tree planting will likely occur on National Forest System Land, but it is unknown whether tree planting will occur on private lands. All areas requiring tree planting will have trees established and free to grow within five growing seasons. Vegetative recovery will vary from 3-20 years. The largest areas that burned at high severity are surrounded by medium severity burn areas and thus are at a greater distance from seed sources. This will slow the vegetative recovery time. The heat produced in the high severity burning in these areas has destroyed much of the existing seed stored in the soil, so shrub, forb, and grass recovery will occur at a slower pace. Encroachment by noxious weeds may be a concern on high burn severity areas adjacent to road and trail corridors where weeds already exist.

Vegetative Recovery Period on NFS Lands - Years

Burn Severity	Total Acres	Reforestation Period	Vegetative Recovery Period *
None to Low	2357	0-5 years	0-5 years
Moderate	648	1-5 years	1-15 years
High	505	3-5 years	3-20 years
Total	3509		

*Vegetative Recovery is considered be any vegetation which provide >80% cover which effectively intercept rainfall and provides an extensive root mass.

B. Design Chance of Success, (percent):	<u>80%</u>
C. Equivalent Design Recurrence Interval, (years):	<u>25 Years</u>
D. Design Storm Duration, (hours):	<u>1/4 Hours</u>
E. Design Storm Magnitude, (inches):	<u>0.53 Inches</u>
F. Design Flow, (cubic feet / second/ square mile):	
G. Estimated Reduction in Infiltration, (percent):	<u>25%</u>
H. Adjusted Design Flow, (cfs per square mile):	<u>110 cfs¹</u>

¹ For design storm analysis, we used a 15 minute, 25 year storm that occurred in Sleeping Child Creek in 2001. This storm produced a 110 cfs¹ runoff in a 1.8 mi² burned watershed (Site 14), which was greater than a 500 year runoff event. This watershed was selected for the design storm because the runoff was water only (not debris) and the watershed was small (Less than 2 Mi²), where impacts are most likely to roads or other facilities. It is possible, that the Hopeful II Fire could receive a similar storm with similar watershed response where burn intensities are high. Storm runoff should be adjusted downward in watersheds where burn intensity is less than high. Road drainage in watersheds less than 2 Mi² should be designed to handle these flows. In watersheds 5 to 20 mi², the design storm should be approximately 23 cfs¹ (Parrett and Others, Fire Hydrology, 7/2003).

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

Based upon the BAER Teams' field survey and analysis, the following emergencies exist on National Forest System lands:

Threat to life and private property:

Hazard trees, trees that are standing and partially burned along trails, are falling, posing a risk to life and private property. Hunting use along trails is heavy in the fall, putting the public in contact with the risk. The risk exists along Trail 46.

Threat to Federal property and aquatic ecosystem integrity:

Accelerated sheet and rill erosion will occur due to the lack of canopy, ground cover, and water repellency of soils. Increased sediment delivery to the stream channels will result in degraded water quality and loss of channel capacity. Runoff will increase due to loss of infiltration capacity. Increased stream flows from high intensity burns in the Hopeful II Fire poses a threat to Road 595, where a culvert is undersized. A potential fill failure on this road would result in detrimental effects to downstream anadromous and T&E fisheries habitat. This threat also exists on a jammer road system in sections 1 and 2 where saturated fills and an undersized culvert could fail due to increased peak flows.

B. Emergency Treatment Objectives:

The emergency treatment objectives are to protect life and property, maintain soil productivity and water quality to protect high value fisheries, and prevent the invasion of noxious weeds. Specifically we are concerned with the potential for (See Treatment Map):

1. Hazard tree removal along Trail 46.
2. Culvert failure on Road 3595 causing detrimental effects to downstream anadromous and T&E fisheries habitat;
3. Road failures on the jammer road system in sections 1 and 2 where saturated fills and an undersized culvert may not handle increases in peak runoff.

Treatments designed to reduce the risk of the potential adverse effects of the fire include:

1. Removal of hazard trees along two miles of Trail 46.
2. Twin, misaligned and undersized 30 inch culverts on the 595 Road at T38N, R14E, Section 2, need to be replaced. The culvert should be designed to handle increased peak flows and accommodate fish passage. Estimated costs are \$30,000;
3. Road 75522 Spur 1. Removal of a 24 inch aluminum culvert is needed to handle increased peak flows expected after the fire. The cost associated with removing the culvert and restoring the channel is \$1667.
4. Road 75222, Station 40+25. A log culvert needs to be removed before peak flows increase and the fill saturates and fails. The cost associated with removing the culvert and reestablishing the channel is \$1667.
5. Road 75226. Head of old debris torrent. Remove the remainder of a previously failed log culvert before peak flows increase and a fill failure results. The cost associated with removing the culvert and reestablishing the channel is \$1667.

C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:

Land % Channel % Roads 80 % Trails 95 %

D. Probability of Treatment Success:

	Years after Treatment		
	1	3	5
Land			
Channel			

	Years after Treatment		
Roads	80%	90%	90%
Trails	95%	100%	100%

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

Two parameters were used to determine the loss of resources if no treatment were applied. These include loss of bull trout, steelhead, and chinook salmon in Crooked Fork Creek valued at \$250,000 and the lost of Road 595 at the replacement culvert site, valued at \$30,000. The total cost of the no action is **\$280,000**.

F. Cost of Selected Alternative (Including Loss):

Implementation of the proposed treatments would have the following affect on the two selected parameters. The potential effects on the bull trout, steelhead, and chinook salmon would be reduced from \$250,000 to \$50,000. The loss of Road 595 would be mitigated to \$6000. The total value of resource loss after implementation of the proposed treatments is reduced to \$56,000. The cost of implementing the proposed treatments is \$36,829. Assuming an 80% treatment success, the total value of successful implementation of treatments is $(0.8) \times (\$56,000 + \$36,829)$ for a total of \$74,263. Added to this amount is the cost of the values lost do to 20% of the treatments not being successful. This amounts to $(0.2) \times (\$56,000 + \$36,829)$ or \$18,565. The total cost of this alternative is the value of successful implementation (\$74,263) plus the value of unsuccessful implementation (\$18,565) or **\$92,829**.

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input type="checkbox"/> Range	<input type="checkbox"/>
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input type="checkbox"/>
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

Team Leaders: Dick Jones and Jim Mital

Email: rmjones@fs.fed.us and jmital@fs.fed.us

Phone: Dick (208-476-8274) Jim (208-476-8348) FAX: 208-476-8329

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: None

Channel Treatments: None

Roads and Trail Treatments: Roads only.

1. Hazard tree removal along two miles of Trail 46. \$1828.
2. Twin, misaligned and undersized 30 inch culverts on the 595 Road at T38N, R14E, Section 2, need to be replaced. The culvert should be designed to handle increased peak flows and accommodate fish passage. **Original estimated cost was \$30,000. Contract cost came in at \$36,700. This interim report is an increase over the original request of \$6,700;**
3. Road 75522 Spur 1. Removal of a 24 inch aluminum culvert is needed to handle increased peak flows expected after the fire. The cost associated with removing the culvert and restoring the channel is \$1667.
4. Road 75222, Station 40+25. A log culvert needs to be removed before peak flows increase and the fill saturates and fails. The cost associated with removing the culvert and reestablishing the channel is \$1667.
5. Road 75226. Head of old debris torrent. Remove the remainder of a previously failed log culvert before peak flows increase and a fill failure results. The cost associated with removing the culvert and reestablishing the channel is \$1667.

Structures: None

I. Monitoring Narrative:

Noxious Weed Monitoring-existing weed populations, primarily of spotted knapweed along road locations, will be monitored for encroachment into areas of moderate to high burn intensity where populations of noxious weeds had not previously been observed. Walk through weed surveys will be conducted within one year to determine if weed invasion is occurring in burn areas. If such monitoring identifies encroachment of noxious weeds into such areas, appropriate treatment measures will be identified and an interim 2500-8 report will be submitted for weed treatment funding. \$500.

Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

A. Land Treatments										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				\$0	\$0		\$0		\$0	\$0
B. Channel Treatments										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treat.</i>				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
Culvert Replacement	Each	36,700	1	\$36,700	\$0		\$0		\$0	\$36,700
Culvert Removal	Each	1667	3	\$5,001	\$0		\$0		\$0	\$5,001
Trail Hazard Trees	Miles	914	2	\$1,828	\$0		\$0		\$0	\$1,828
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road & Trails</i>				\$43,529	\$0		\$0		\$0	\$43,529
D. Structures										
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Structures</i>				\$0	\$0		\$0		\$0	\$0
E. BAER Evaluation										
Salary	Ea	12300	1	\$12,300						\$12,300
Travel/Per Diem	Ea	425	1	\$425	\$0		\$0		\$0	\$425
Imagery/Equip	Ea	2850	1	\$2,850	\$0		\$0		\$0	\$2,850
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				\$15,575	\$0		\$0		\$0	\$15,575
F. Monitoring										
Weed Monitoring				\$500	\$0		\$0		\$0	\$500
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				\$500	\$0		\$0		\$0	\$500
G. Totals										
				\$59,604	\$0		\$0		\$0	\$59,604

PART VII - APPROVALS

1. _____
Forest Supervisor (signature) _____ Date _____
2. _____
Regional Forester (signature) _____ Date _____