FS-2500-8 (8/93)

USDA-FOREST SERVICE Date of Report: **March 22, 1995**

BURNED-AREA REPORT
(Reference FSH 2509.13)
Rabbit Creek Fire
Wilderness, Boise National Forest Portion

PART I - TYPE OF REQUEST

A. Type of Report

[ ] 1. Funding request for estimated EFFS-FW22 funds
[X] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[ ] 1. Initial Request (best estimate of funds needed to complete eligible rehabilitation measures)

Funding request based on two-thirds of fire area

[ ] 2. Interim Report
[ ] Updating the initial funding request based on more accurate site data and design analysis
[ ] Status of accomplishments to date

[X] 3. Final report - following completion of work

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: **Rabbit Creek Fire** B. Fire Number: **IDBOF165**

C. State: **Idaho** D. County: **Boise and Elmore**

E. Region: **Intermountain R-4** F. Forest: **Boise and Sawtooth**

G. District: **Idaho City and Lowman Ranger Districts, and Sawtooth NRA**

H. Date Fire Started: **July 28, 1994** I. Date Fire Controlled: **Oct. 8, 1994**

J. Suppression Cost: **$1,000,000**

K. Fire Suppression Damages Repaired with EFFS-PF12 Funds:

1. Fireline waterbarred (miles) **110 miles** 25 miles hand, 85 miles cat line. Also cleaned out 15 creek crossings and waterbarred 50 safety zones.
2. Fireline seeded (miles) **110**
3. Other (identify) _____

L. Watershed Number: **17050111-16, 19, 20 1750120-44**

M. NFS Acres Burned: **57,220 *** Total Acres Burned: **154,100**

* This report considers 57,220 acres of the total 154,100 acres of fire area. The entire fire is NFS lands.

N. Vegetation Types: **14%-Brush, Doug-fir,P.Pine,Aspen 13%-Grass 12%-Doug-fir, Lodge.pine,Alpine-fir moderate 12%-Brush 12%-Doug-fir, Lodge.pine,Alpine-fir dense 11%-Doug-fir,P.Pine open**

O. Dominant Soils: **Typic Cryorthents, Lithic Cryorthents, Typic Cryumbrepts, Lithic Cryumbrepts**

P. Geologic Types: **Glaciated and Weathered Grantitics**

Q. Miles of Stream Channels by Order or Class:
1st order: **449 miles** 2nd order: **118.0 miles**
3rd order: **50.5 miles** 4th order: **13.25 miles** 5th order: **2.5 miles**

R. Transportation System:
Trails: **44** miles Roads: **16** miles

PART III - WATERSHED CONDITION

A. Fire Intensity (acres): **17187** (low) **16446** (moderate) **16150** (high)
(30%) (29%) (28%)
7444 (unburned in fire perimeter)
~~(13%)~~
24631

B. Water-Repellent Soil (acres): **1720** (low) **4935** (moderate)
(by burn intensity) **9690** (high) **16345** (total acres)

C. Soil Erosion Hazard Rating (acres):
996 (low) **7680** (moderate) **48544** (high)

D. Erosion Potential: **12.3** tons/acre

E. Sediment Potential: **966** cubic yards/square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period: **3-5** years
Note: Portions of the burned area will recover to 50 percent soil cover within 2 to 3 years. Experience with previous fires on the Forest leads us to believe that without treatments, high elevation basins will take significantly longer.

B. Design Chance of Success: **80** percent. **This chance of success is only for the area being treated above the Graham airstrip, not the entire area.** The remainging area is receiving no treatment for soil productivity or water quality.

C. Equivalent Design Recurrence Interval: **25** years

D. Design Storm Duration: **24** hours

E. Design Storm Magnitude: **4** inches

F. Design Flow: **20** cubic feet per second per square mile

G. Estimated Reduction in Infiltration: **55** percent

H. Adjusted Design Flow: **300** cubic feet per second per square mile

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

Based on the BAER team field survey and analysis, the following emergencies exist as per FSH 2509.13:

A total of 154,100 acres were burned in the Rabbit Creek fire, all on National Forest System land. This part of the report analyzes 57,220 acres of the fire including small portions of Alexander Flats, Black Warrior, and Tenmile, and the entire North Fork Boise watersheds. The other portion of the fire was covered in the report submitted for Regional review October 5, 1994.

1. Loss of Soil and Onsite Productivity:

About 97 percent (48,544 acres) of the burned NFS lands evaluated in this report have a high erosion hazard rating. Hydrophobic soils occur on 28 percent of NFS lands burned (16,345 acres). About 57 percent (32,596 acres) of the fire area burned at moderate to high intensities, eliminating effective ground cover. The average soil loss over the Forest Service land in the burn area is expected to be approximately 12.3 tons per acre during the first 2 years. This greatly exceeds the approximated annual rate of soil formation. There is a concern that soil productivity due to accelerated soil erosion from high and moderate burn intensities on 57 percent of the area could be reduced as a result of the fire. Reductions in soil productivity will impact vegetative production and other resource uses. The value of soil and productivity losses is estimated at $25 per ton for a total at risk value of $12.9 million.

2. Loss of Water Control and Deterioration of Water Quality:

The watersheds in the burned area have a potential for increased sedimentation and its effects on water quality. Potential for long-term and short-term sediment related damage exists as a result of the fire. There are numerous perennial streams within the evaluated watersheds. The beneficial uses of these creeks include salmonid fisheries and TES bull trout "key watershed" (valued at $1.2 million), livestock watering, and recreational uses at campgrounds, picnic areas, fishing, and sightseeing. They also provide water to Arrowrock Reservoir which serves as a major recreational area for the Treasure Valley, flood control, irrigation, and hydroelectric power generation. Impacts to the reservoir includes contributions of sediment which could reduce storage, increases in nutrients affecting vegetation and weed management in downstream irrigation systems, and impacts to reservoir recreational uses.

The North Fork Boise River Basin is inclusive of one regional bull trout population. Bull trout have been determined to be warranted for listing by the U.S. Fish and Wildlife Service. In order to have long-term viability, a regional bull trout population needs to have 6 to 10 locally reproducing populations. Extensive surveys within the North Fork Boise Basin in 1993 and 1994 found only three local populations. Two of these, located in the upper North Fork within the Sawtooth Wilderness Area, are at high risk of habitat destruction from fire induced sediment and flood events. The wilderness designation precludes emergency rehabilitation measures which would be needed to protect these populations. See Appendix - Sawtooth National Forest wilderness value discussion.

3. Threats to Human Life and Property Onsite and Offsite:

Aerial and field observations were conducted to determine potential threats to life and property from increased flood and debris torrents associated with the post fire watershed condition. There were no direct concerns to any of the Forest Service building facilities or established campgrounds. The Graham Landing Strip could be at risk from a flood event originating upslope from the airstrip. Repair and clean up costs if this occurs is estimated at $20,000.

There is a concern for the numerous dispersed campsites and recreation trails adjacent to or directly below drainage ways (0 to third order drainages) which are susceptible to debris torrents/mudflows. Numerous small debris torrents/mud slides have occurred as a result of a light to moderate intensity storm on September 29, 1994. Two of these have blocked the North Fork Boise River road 327 and blocked two-thirds of the North Fork Boise River with an alluvial fan.

While past recreation use in the area was over 5,000 RVD's per year, use during the first few years following the fire is projected at approximately 1,750 recreation visitor days annually. Oftentimes, recreationists or forest workers may not be aware of the potential flood threat as the lower watershed may be unburned while the upper watershed was burned at moderate to high intensities. There are also over 16 miles of roads and 44 miles of trails which present a large safety concern relative to public use.

Of the 44 miles of trails, 33.5 miles are in the Sawtooth Wilderness. About 5.3 miles of these trails have a high probability of being washed out due to increased flows from the burned area. The trails at risk are valued at approximately $670,000.

There are 16 miles of roads in the burned area. None of the road will be treated with this report.

These trails will act as collectors for increased overland flows. Damage will be compounded where drainage structures are inadequate to handle increased flows and debris. The failure of these drainage systems may also trigger debris torrents in drainages below the trails. To protect the trail network, treatments are needed on approximately 5.3 miles of trails, and 20 trail drainage crossings.

B. Emergency Treatment Objectives:

To address the above emergencies identified by the BAER team, the following objectives were identified:

Provide for the protection of life and property (Graham airstrip and trails) within the burn, and potential downstream impact areas using a variety of channel and slope stability treatments which have been demonstrated to be effective in similar burned areas (see narrative treatments).

Provide information to general and specific publics and Forest users about the potential threats to life and property.

Due to wilderness values and ideals, no treatments to maintain long-term productivity of the ecosystem is being prescribed.

C. Probability of Completing Treatment Prior to the First Damage Producing Storm

Land 60 percent Channel 80 percent Trails 75 percent Other _____ percent
(Assuming that spring snow melt is the first major damage producing event.)

D. Probability of Treatment Success

	<----Years after treatment---->		
	1	3	5
Land	70%	85%	95%
Channel	70%	85%	100%
Trails	70%	90%	100%
Other			

E. Cost of No-Action (Including Loss): **$ 14,846,684**

F. Cost of Selected Alternative (Including Loss): **$ 14,362,640**

G. Skills Represented on Burned-Area Survey Team

[X] Hydrology	[X] Soils	[X] Range	[X] Fisheries
[X] Timber	[X] Wildlife	[X] Fire Mgmt.	[X] Engineering
[X] Plant Mtls	[X] Ecology	[X] Recreation	[X] Archaeology
[X] S.C.S.	[X] State Lands	[X] IDFG	[X] FS Research
[X] Contracting	[X] TES	[X] Botony	[X] Incident Command

[X] Sawtooth National Forest Representatives

Incident Commander: **Terry Sexton**
Phone: **208-364-4330** DG Address: **T.Sexton:R04F02D03A**
Team Leaders: **Monte Williams, John Thornton, Leah Juarros, Warren Ririe Terry Hardy**

H. Treatment Narrative:

Land Treatments:

Contour Felling. Trees will be dropped along slope contours (less than 70 percent slopes) in order to trap eroded material and decrease hydraulic slope length which reduces the erosional energies of the water. Additional benefits occur with the breakup of the water repellant soil layer due to the trenching of the soil for the installation of the contour felled logs. This serves as a "sink" for the water to infiltrate to the subsoil thereby reducing the volume of runoff. Trees should be 8 to 12 inches in diameter at the largest end and 30 feet in length with 45 trees per acre. Treatment costs are estimated at $200 per acre. 360 acres will be treated using this method ($72000) to protect the Graham airstrip and road per direction established in the Forest Plan.

Slash Pile Windrows. A filter strip of felled trees and slash will be created along the toe of the slope above the Graham air strip. This will be constructed to further protect the airstrip from flood and debris torrents. The filter strip will be 3,200 feet long and will cost approximately $16,000.

Channel Treatments:

Base Level Control. These structures are a second line of defense with three objectives (in order of priority): (1) to reduce stream down cutting, (2) to reduce instantaneous peak runoff by routing through small basins, (3) to act as small sediment reservoirs (approximate capacity is 10 cubic yards per structure).

These structures may be constructed from adjacent logs constructed and placed appropriately in zero and first order stream channels. The criteria for treatment is as follows: 0 to first order channels; less than 15 percent channel bottom gradient; located in or directly downstream from moderate to high burn intensity/severity areas; approximately 1 structure per 100 feet of channel length (52/mile). Installation specifications will be detailed in the contracts.

70 structures on 1.2 miles of channel will be placed upslope from the Graham airstrip at a cost of $12,250 ($175 per structure).

These treatments are to protect the airstrip. However, associated watershed benefits are valued at $110,700.

Transportation System Treatments:

Trails. There are approximately 44 miles of recreation trails in the burned area. Of these, 33.5 miles of trail are in the Sawtooth Wilderness and 3.5 miles are in the Ten Mile - Black Warrior proposed wilderness area. About 5.3 of these miles are subject to extreme erosion. In a flood event, it is likely they would be significantly eroded requiring replacement. Without treatment, they would concentrate overland flows and contribute to increasing sediment discharges and soil productivity losses. Improving drainage would protect the trail and significantly reduce sedimentation. Drainage improvement would include construction of water bars and placement of cribbing. Approximately 5.3 miles of trail and 20 stream crossings would need to be treated at a cost of approximately $51,434.30.

Other Treatments:

Livestock Grazing Controls. The Forest will establish recovery criteria which will be met before livestock grazing will be allowed on the burned area. Sheep will be excluded from the burned area until recovery criteria are met. The permittee may be required to take nonuse for resource protection on grazing allotments until the criteria are met or relocate sheep use to the Sand Creek or other Forest allotments in vacant or nonuse status. The criteria may include measurements of soil cover, riparian vegetation recovery, seeding establishment, impacts to conifer regeneration, etc. Grazing management strategies and trailing routes may also need be altered at least in the short-term once grazing resumes. Protection fencing will not be required.

Mud and Flood Patrols. Given the identified risks in the burn area, and the potential for plugged culverts, etc., the patrol would be used to identify problems needing immediate treatment. Backhoes or other equipment would need to be available to respond to these situations. Cost for this activity is estimated at $2,000.

Bull Trout Relocation. Fisheries surveys in 1994 located unoccupied habitat in a pristine reach of the upper Bear River above a series of possible barriers to fish migration. Habitat conditions in this un-burned watershed are comparable to pre-fire habitat conditions within the upper North Fork Boise River that have been used for production of bull trout. With the high risk of post-fire habitat destruction in the upper North Fork Boise Basin, transfer of juvenile bull trout from this basin into the vacant habitats of the upper Bear River would present a unique opportunity to expand the range of bull trout within their present ecosystem. The Forest will work with the Idaho Department of Fish and Game to evaluate and if possible transplant bull trout into this basin. While this recommendation is made in this report, **BAER funds would not be used** to execute this proposal.

PART VI - EMERGENCY REHABILITATION TREATMENTS AND SOURCE OF FUNDS BY LAND OWNERSHIP

Line Items	NFS Lands				Other Lands		All		
	Units	Unit Cost $	Number of Units	EFFS-FW22 $M	Other $ ident.	Number of Units	Fed $ ident.	Non-Fed $ ident.	Tota $
A. LAND TREATMENTS									
Contour Felling	acres	167	204	$ 34					$ 34
Windrow	feet								
B. CHANNEL TREATMENTS									
Falling in channels	miles	2500	2	$ 5					$ 5
C. ROADS AND TRAILS									
Trail Prescription	miles	1340	7.2	$ 9.5					$ 9.
Trail Crossing Treatment	each								
D. SAFETY									
Mud & Flood Patrol				$ 2					$ 2
Hazard ID and Signing	each	100	10	$ 1					$ 1
E. BAER EVALUATION / ADMINISTRATIVE SUPPORT									
Interdisciplinary Team				$ 15					$ 15
Implementation Admin.				$ 5					$ 5
F. TOTALS				$ 71.5					$ 71.

Due to early snow that made conditions unsafe, it was impossible to continue. Condition will be analyzed this spring to determine if an emergency still exists. If a watershed emergency is documented, we will request additional BAER funding to complete planned treatments.

FS-2500-8 (8/93)

USDA-FOREST SERVICE

Date of Report: **March 23, 1995**

BURNED-AREA REPORT
(Reference FSH 2509.13)
Rabbit Creek Fire

PART VII - APPROVALS

1. **/s/ Laurie Tippin** **3-29-95**
Cathy Barbouletos — Date
Acting Boise NF Forest Supervisor

3. _____ _____
Dale N. Bosworth — Date
Regional Forester

COST-RISK ANALYSIS OF BURNED-AREA REHAB. TREATMENTS

FIRE: Rabbit Creek, Boise National Forest, 1994 DATE: 10/11/94

ALTERNATIVE: Investment Alternative - North Analysis Unit

PRIMARY TREATMENT. PROBABILITY OF (A) SUCCESS 80%
(B) FAILURE 20%

Treatments	Units	Amount	Unit Cost	Total Cost
1. Admin and IDT Costs				$80,000
2. Trails	miles	5.3	$5,710	$30,263
3. Trail Crossings	each	20.0	$1,050	$21,000
4. Contour Felling	acres	360.0	$200	$72,000
5. Slash Filter Windrow	feet	3200.0	$5	$16,000
6. Channel Structures	each	70.0	$175	$12,250
7. Safety				$3
	(C) Total =			$231,516

PROBABLE RESOURCE VALUE LOSS

Item	---Probable Dollar Loss--- (D) Success	(E) Failure
1. Soil Productivity	$12,789,300	$12,900,000
2. Graham Airstrip	$0	$20,000
3. Fisheries (downstream value	$1,181,684	$1,181,684
4. Recreation Trails	$0	$670,000
Total =	$13,970,984	$14,771,684

FALLBACK TREATMENT. PROBABILITY OF (F) SUCCESS 0%
N/A (G) FAILURE 0%

Treatments	Units	Amount	Unit Cost	Total Cost
1.		0.0	$0	$0
2.		0.0	$0	$0
3.		0.0	$0	$0
4.		0.0	$0	$0
	(H) Total =			$0

PROBABLE RESOURCE VALUE LOSS

Item	---Probable Dollar Loss--- (I) Success	(J) Failure
1.	$0	$0
2.	$0	$0
3.	$0	$0
4.	$0	$0
Total =	$0	$0

TOTAL ALTERNATIVE COST = $14,362,640

COST-RISK ANALYSIS OF BURNED-AREA REHAB. TREATMENTS

FIRE: Rabbit Creek, Boise National Forest, 1994 DATE: 10/11/94

ALTERNATIVE: No Action Alternative - North Analysis Unit

PRIMARY TREATMENT. PROBABILITY OF (A) SUCCESS 100%
(B) FAILURE 0%

Treatments	Units	Amount	Unit Cost	Total Cost
1. Admin and IDT Costs				$75,000
2. Trails	miles	0.0	$5,000	$0
3. Trail Crossings	miles	0.0	$1,500	$0
4. Contour Felling	acres	0.0	$200	$0
5. Slash Filter Windrow	feet	0.0	$25	$0
6. Channel Structures	each	0.0	$175	$0
7. Safety				$0
	(C) Total =			$75,000

PROBABLE RESOURCE VALUE LOSS

Item	---Probable Dollar Loss--- (D) Success	(E) Failure
1. Soil Productivity	$12,900,000	$0
2. Graham Airstrip	$20,000	$0
3. Fisheries (downstream value	$1,181,684	$0
4. Recreation Trails	$670,000	$0
Total =	$14,771,684	$0

FALLBACK TREATMENT. PROBABILITY OF (F) SUCCESS 0%
N/A (G) FAILURE 0%

Treatments	Units	Amount	Unit Cost	Total Cost
1.		0.0	$0	$0
2.		0.0	$0	$0
3.		0.0	$0	$0
4.		0.0	$0	$0
	(H) Total =			$0

PROBABLE RESOURCE VALUE LOSS

Item	---Probable Dollar Loss--- (I) Success	(J) Failure
1.	$0	$0
2.	$0	$0
3.	$0	$0
4.	$0	$0
Total =	$0	$0

TOTAL ALTERNATIVE COST = $14,846,684

APPENDIX

SAWTOOTH WILDERNESS REHAB DECISION

Discussion

Approximately 29,000 acres of the Sawtooth Wilderness were burned or impacted by the Rabbit Creek fire in September 1994. The areas burned included the North Fork Boise River, and Johnson, Ballentine, and Pinchot creeks. Fire suppression was appropriate and maintained sensitivity to the wilderness resource. Very little damage to Sawtooth Wilderness resources can be attributed to the fire suppression activities that occurred, no bulldozers were used, and natural barriers were employed as much as feasible to contain the fire. This is compatible with wilderness management objectives: "Permit lightning caused fires to play, as nearly as possible, their natural ecological role in Wilderness"; (FSM 2324.2) and "Maintain a natural ecosystem by allowing fire to play a natural role . . . . Conduct all fire management activities in a manner compatible with wilderness management objectives. Preference will be given to methods and equipment that least alter the wilderness landscape, or disturb the land surface". (FLRMP, p. IV-156).

FSM 2323 discusses burned area rehab planning in wilderness. It directs promotion of natural healing processes, and authorizes artificial rehab, including seeding, only to prevent unnatural loss of wilderness resources or to protect life and property outside of wilderness. Historically, fire has not been suppressed in this area; fire scars indicate fire has been present at intervals of from 30 to 250 years ago. We do not seem to have an unnatural forest condition due to human disruption of natural fire cycles. The most sensitive resource in the area burned by the fire is bull trout habitat. Sedimentation and small landslides will almost certainly occur during spring runoff, causing short-term impacts to bull trout populations. Trails in the area may become channels for runoff from the burned off slopes they traverse, increasing potential for sedimentation and erosion.

Because the Rabbit Creek fire was an event that was essentially natural, due to the near natural conditions in the west side of the wilderness, and that no threat to life or property exists, it was determined that no artificial rehab would take place within the wilderness or the recommended wilderness burned in the fire. Effects on bull trout will be short-term and not irreversible or irretrievable. The helispots, firelines, and spike camps used in suppression efforts were left in such good condition that no rehab will be needed on them either. The only need for artificial rehab will be on the Johnson Creek and North Fork trails which will be heavily waterbarred to minimize erosion potential from these human imposed facilities in the wilderness. Intermountain research will be contacted to set up a monitoring program to study the recovery of the area for possible use as a baseline for rehab efforts outside of the wilderness.

(Terry Clark, Sawtooth National Forest)