FS-2500-8 (8/93)

USDA-FOREST SERVICE Date of Report: **March 21, 1995**

BURNED-AREA REPORT
for Bannock Creek (Reference FSH 2509.13)

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)

[ ] 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: **Idaho City Complex**
Bannock Creek Fire B. Fire Number: **P41874**

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

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

G. District: **Idaho City D-4**

H. Date Fire Started: **July 28, 1994** I. Date Fire Controlled: **Aug. 10, 1994**

J. Suppression Cost: **$ ***

* The fire suppression cost was included with the Rabbit Creek fire and called the Idaho City Complex. The Bannock Creek fire was a very small portion of this complex, approximately 1.2 percent.

K. Fire Suppression Damages Repaired with EFFS-PF12 Funds:
1. Fireline waterbarred (miles) **2.5**
2. Fireline seeded (miles) **6.1**
3. Other (identify) **drop points, helispots, IC Base**

L. Watershed Number: **Boise River - 17050111, Mores/Grimes - 17050112**

M. NFS Acres Burned: **2000** Total Acres Burned: **2000**
Ownership type:
( )State ( )BLM ( )PVT ( )

N. Vegetation Types: **DF/PP 70%, Mtn. Brush 20%, Sage/grass 10%**

O. Dominant Soils: **Typic Cryumbrept, Typic Cryorthent, Typic Xerorthent, Lithic Xerorthent**

P. Geologic Types: **Idaho Batholith Granitics**

Q. Miles of Stream Channels by Order or Class:
1st order: **4.2 miles** 2nd order: **0.6 miles**

R. Transportation System:
Trails: **0.85** miles Roads: **16.2** miles

PART III - WATERSHED CONDITION

A. Fire Intensity (acres): **1,150** (low) (57.5%) **530** (moderate) (26.5%) **320** (high) (16.0%)

B. Water-Repellent Soil (acres): **609**

C. Soil Erosion Hazard Rating (acres):
0 (low) **1,128** (moderate) **872** (high)

D. Erosion Potential: **4.0** tons/acre

E. Sediment Potential: **379.0** cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period: **3** years

B. Design Chance of Success: **70** percent

C. Equivalent Design Recurrence Interval: **10** years

D. Design Storm Duration: **6** hours

E. Design Storm Magnitude: **1.5** inches

F. Design Flow: **15.6** cubic feet per second per square mile

G. Estimated Reduction in Infiltration: **53** percent

H. Adjusted Design Flow: **73.4** 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:

1. Loss of Soil and Onsite Productivity:

The average soil loss over the burn area is expected to be approximately 4.0 tons per acre during the first 2 years (see Part III,D). There is a high concern for the loss of soil productivity due to accelerated soil erosion from high and moderate burn intensities on 43 percent of the area with a strong hydrophobic condition on 609 acres. This land supports a large percentage of commercial timber land as well as the majority of the Bannock Creek Research Natural Area (RNA) and a portion of the Boise Basin Experimental Forest (BBEF). Based on the recommendations of John Sloan, Research Forester and BBEF Coordinator from the Intermountain Research Station, only emergency road and fireline rehabilitation measures are recommended to keep consistent with the RNA's establishment plan.

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

The beneficial uses of Bannock Creek include: (a) providing a cold water source for the salmonid fishery in Mores Creek; and (b) providing water to Lucky Peak Reservoir which serves as: a major recreational use for the Treasure Valley, flood and irrigation control, and hydroelectric power generation. Currently, aquatic habitat conditions in Mores Creek are poor. Mores Creek supports primarily a put-and-take fishery and provides many angler hours of recreation. The impact of the Bannock Creek fire on the Mores Creek fishery is expected to be minor (see discussion in appendix). Impacts to Lucky Peak Reservoir are expected to be negligible due to the relative size of the fire and the distance between the fire and reservoir. As mentioned above there is high risk associated with concentrated road runoff creating debris torrents in first and second order drainages.

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

There are no human residences within the Bannock Creek drainage. Bannock Creek flows into Mores Creek 1.5 miles east of Idaho City. The effect of increased runoff from the Bannock Creek drainage to Mores Creek will not be great enough to significantly impact private property, downstream communities, bridges and reservoirs.

Approximately 16 percent of the Bannock Creek fire area burned at high severity (320 acres), of which 70 percent contained hydrophobic soils (224 acres). Approximately 27 percent of the total area (530 acres) burned at moderate severity, of which 40 percent contained hydrophobic soils (212 acres). The remaining area 57 percent (1,150 acres) burned at low severity of which 15 percent contained hydrophopic soils (173 acres). Bannock Creek will experience increases in peak flow and flood frequency as a result of the fire. The increase in discharge from Bannock Creek is expected to be a small addition to the flow in Mores Creek which is a significantly larger watershed. Culverts associated with FDR's - 203, 304, 306, and 333 and associated spur roads within the burned area have a high probability of being overtopped and roads being washed out due to the increased flows from the fire effects on the hydrologic

functioning of the slopes and stream channels. This condition may worsen due to the increase in debris causing impedance to water flow through culverts. In addition, these roads will serve as collectors for increased overland flows resulting from the loss of surface vegetation and underground flows resulting from reduction in transpiration due to loss of tree cover. This compounds the impact on the roads existing drainage structures which will lead to concentrated runoff to first and second order channels which may trigger debris torrents.

B. Emergency Treatment Objectives:

To address the above emergencies identified by the BAER team, the following objective was identified:

Retain soil onsite to maintain the long-term productivity of the ecosystem and maintain control of water by a variety of road treatments which have been demonstrated effective in similar burned areas (see narrative treatments).

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

Land NA % Channel NA % Roads 100 % Other NA %

D. Probability of Treatment Success

	<----Years after treatment----->		
	1	3	5
Land	NA	NA	NA
Channel	NA	NA	NA
Roads	80%	100%	100%
Other			

E. Cost of No-Action (Including Loss): $ **733,500**

F. Cost of Selected Alternative (Including Loss): $ **523,100**

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology	[X] Soils	[ ] Geology	[X] Range
[X] Timber	[X] Wildlife	[ ] Fire Mgmt.	[X] Engineering
[ ] Contracting	[X] Ecology	[X] Research	[X] Archaeology
[X] Fisheries	[ ] _____	[X] Plant Mtls	[ ] _____

Team Leader: **Monte Williams**
Phone: **208-364-4330** DG Address: **M.Williams:R04F02D03A**

H. Treatment Narrative:

Road Treatments:

Purpose. The property represented by the road itself, as well as the potential increase in sediment load created by fill failures, stream routing down inside ditches, and eventual blowouts into new channels, as well as the loss of service roads, make treatments to ensure road drainage and protection of crossings a critical treatment. Accelerated runoff, due to the newly formed hydrophobic layers and bare surfaces, put culverts and existing road drainage at risk. The mechanism of road failure from overflow conditions is typically debris blockage of culverts or other drainage structures and increased peak runoff due to hydrophobic soils and loss of ground cover. This allows water flows to generate enough volume and velocity to erode the roadway at drainage crossings, ditch lines, or road surface. Treatment prescriptions are designed to alter the structure of the road, or the drainage system to prevent this occurrence.

Treatment. The strategy employed by all prescriptions is to provide backup for all drainage structures in the event of failure, rather than increase structure water capacity. These roads require intensive treatment to ensure their structural integrity through anticipated higher runoff from thunder storms (by as much as ten times). Culverts will only be replaced when the existing culvert cannot be conditioned or where inadequate culverts can be replaced with culverts with minimal earth work. General removal of culverts was also considered an excessive measure due to the expense or re-installing them based on the need for the road facilities for future resource management.

Blockage or overflow of culverts and other structures will be accommodated by installation of rolling dips or cross-ditches. Dip/ditch installation is much faster and less expensive than culvert modification and serves the purpose of removing water from the roadway before flow volumes and velocities create erosion. They can also be easily removed from the roadway once the risk of increased runoff diminishes. The drainage system of the original road is thus preserved to resume normal use when runoff decreases to original design levels. In addition other road treatments include catch basin clearing and cleaning and spot rocking for water energy dissipation. All of the treatments have been previously proven effective in burned areas.

1. The Inslope Road Prescription applies to arterials and collectors located within watersheds of high to moderate burn intensity. These roads are a major capital investment and will serve as the principal haul routes for timber salvage.

Inslope roads use culverts and ditches for ordinary drainage. Standard Forest Service Specification for Construction of Roads and Minor Drainage Structures describe the work items and they have been costed according to the Region 4 Cost Estimating Guide for Road Construction.

The total mileage listed for this prescription is 5.2 miles. The total cost for anticipated work is $33,800 or $6,500 per mile.

Work on these roads is to include the following items as needed: installation of rolling dips, installation of cross-ditches, excavation of culvert catch basins, reconditioning culverts, culvert replacement, placing riprap to armor crossings and fillslopes, and placing straw bale dams in draws above culverts.

2. Outslope Road Prescription have no or very few culverts. They are primarily local roads intended for seasonal use, or no longer used. Some of these roads have been previously blocked; however, design for drainage at the time of closure did not consider the increased overland flows which would occur with the loss of timber, vegetation and litter following fire. Drainage is intended to be dispersed along the template and dips are used at drainage crossings. Failure of these roads could have disastrous effects on streams and arterial collector roads further down slope. It is important to fortify these roads, whether opened or closed, to accommodate additional runoff.

The best treatment for these roads is to improve their drainage. The main concern of these roads is that water may run down the road rather than across the outslope because often the grade of the road is greater than the grade of the outslope. This could lead to concentration of flow volumes and velocities sufficient to cause erosion. Most of these roads are located mid-slope on highly erodable soils.

The total mileage listed for this prescription is 11 miles. The total cost for anticipated work is $15,400 or $1,400 per mile. Work on these roads is to include the following items as needed: remove and or scarify road surface (could be by ripping), ensure adequate outsloping, and install waterbars every 100 feet to prevent flow volumes from running down the road. This will greatly reduce risk of failure and allow for fast restoration during next year's season.

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

			NFS Lands			Other Lands			All
Line Items	Units	Unit Cost $	Number of Units	EFFS-FW22 $	Other $ ident.	Number of Units	Fed $ ident.	Non-Fed $ ident.	Total $
A. LAND TREATMENTS									
B. CHANNEL TREATMENTS									
C. ROADS AND TRAILS									
Inslope Prescription	miles	2551	10.2	26,021		NA			26,0
Outslope Prescription	miles	1170	10.8	12,640		NA			12,6
D. STRUCTURES									
E. BAER EVALUATION/ ADMINISTRATIVE SUPPORT									
InterDisciplinaryTeam	days	250	35	8755					875
Administration	days	250	2	506					50
F. TOTALS				$47,922					$ 47,9

PART VII - APPROVALS

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

2. _____ _____
   Dale Bosworth — Date
   Regional Forester