

# **CHERRY CREEK II FIRE**

## **Burned Area Emergency Response (BAER) Initial Plan**



Cherry Creek II Fire – 10/28/2003

<b>Agency/Unit:</b>	<b>U.S. Forest Service, Uinta National Forest</b>
<b>Location:</b>	<b>Provo, Utah</b>
<b>Report Date:</b>	<b>May 27, 2004</b>
<b>Prepared By:</b>	<b>Cherry Creek II BAER Team</b>

## **TABLE OF CONTENTS**

<b>TABLE OF CONTENTS</b> .....	2
<b>PART I - TYPE OF REQUEST</b> .....	3
<b>PART II - BURNED-AREA DESCRIPTION</b> .....	3
<b>PART III - WATERSHED CONDITION</b> .....	5
<b>PART IV - HYDROLOGIC DESIGN FACTORS</b> .....	5
<b>PART V - SUMMARY OF ANALYSIS</b> .....	6
<b>PART VI - APPROVALS</b> .....	13

## **EXHIBITS**

The following Exhibits have been prepared, but are not attached to this Initial Report. They are available upon from the Uinta National Forest BAER Coordinator.

### **EXHIBIT A – COST/RISK ANALYSIS**

### **EXHIBIT B – RESOURCE ASSESSMENTS**

1. Fire Severity Determination
2. Soil Resources
3. Wildlife Resources
4. Botanical, TES Plant, Noxious Weeds and Invasive Species
5. Water Resources
6. Cultural Resources
7. Fishery Resources
8. Roads

### **EXHIBIT C – MAPS**

1. Vicinity Map
2. Fire Perimeter – Topographic Map
3. Digital Ortho Photography
4. Treatments Considered by the BAER Team and Discussed with the Forest (Alternative 1)
5. Treatments Recommended by the BAER Team
6. Cherry Creek II Fire – Fire Progression
7. Land Ownership
8. Slope Classification
9. Burned Area Reflectance Classification (BARC)
10. Complete Watersheds – 6<sup>th</sup> Order HUC
11. Cherry Creek II Fire – Watersheds – 6<sup>th</sup> Order HUC
12. Hydrologic Analysis
13. Precipitation Zones
14. Geology
15. Land System Inventory
16. Hydrologic Groups
17. K Factors
18. Suitability for Broadcast Seeding
19. Vegetation
20. Deer Winter Range
21. Elk Winter Range
22. Bonneville Cutthroat Trout and Riparian Habitat
23. Noxious Weeds

### **EXHIBIT D – PHOTO DOCUMENTATION**

### **EXHIBIT E – DETAILED MONITORING REPORT**

**BURNED-AREA REPORT edited J.Bruggink 6/1/04**  
(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: Cherry Creek II                      B. Fire Number: P4AXP2  
C. State: Utah    D. County: Utah  
E. Region: R4 - Intermountain                      F. Forest: 0418 - Uinta  
G. District: D3 - Spanish Fork  
H. Date Fire Started: 10/25/2003                      I. Date Fire Contained: 10/31/2003  
J. Suppression Cost: \$740,000 (estimated final cost taken from ICS-290 dated 10/31/2003)  
K. Fire Suppression Damages Repaired with Suppression Funds  
    1. Fireline waterbarred (miles): 0.5 miles – Some of the fire (dozer) line located on National Forest System ( NFS ) lands within lower Dry Canyon will need to be waterbarred and reshaped again using P4AXP2 funds. The BAER Team also identified another 1.3 miles of fireline (dozer line) located on private lands that the BAER Team recommends (landowner and State of Utah willing) be obliterated, waterbarred and seeded for erosion prevention using fire suppression (non-BAER) funds.  
    2. Fireline seeded (miles): None. This fire received heavy snow the last day of the fire, which made access very difficult or impossible. All 1.8 miles of fire (dozer) line should be seeded for erosion control (using a seed mix similar to the one described in this report) for erosion prevention.  
    3. Other (identify): Two (2) helispots were established within the burned area. This action did not cause any resource damage.

L. Watershed Number: The fire burned within three 6<sup>th</sup> field HUCs -

- 1) 160202020401 – Headwaters / Left Fork Hobble Creek
- 2) 160202020403 – Outlet / Left Fork Hobble Creek
- 3) 160202020404 – Outlet / Right Fork Hobble Creek

M. Total Acres Burned: 6,034 ac. (based on RSAC Satellite Image dated 5/2004)  
NFS Acres ( 4,657 ac. ) Other Federal ( 0 ac. ) State ( 0 ac. ) Private ( 1,377 ac. )

N. Vegetation Types: The vast majority of the burned-area had mountain shrubs with interspersed patches of perennial grasses occurring on moderately steep to very steep terrain. The dominant shrubs were 1) oak brush, 2) maple, 3) snowberry, 4) mountain big sagebrush and 5) bitterbrush (94% of the burned-area). Perennial grasses, annual grasses and scattered forbs occurred on both south and west facing slopes at the lower elevations (2% of the burned-area), small areas of mountain big sagebrush were intermixed throughout the burn (2% of the burned-area), tree dominated / riparian zones were located within lower Granger Canyon (1% of the burned-area), and scattered aspen stands occurred at the high elevations on the north slope of Granger Mountain (1% of the burned-area). ( UIF GIS, Mid-scale Vegetation Layer, 2004 ) A few junipers, mountain mahogany, and conifers were scattered throughout the burned-area. Many of these were found on rocky areas which burned only around the fringes.

O. Dominant Soils: Soils mapped within the mountain shrub communities included Boralfic Argixerolls, Abruptic Palexerolls and Pachic Argixerolls. The soils occurring under the aspen were mapped as Typic Cryoborolls. Cumulic Cryoborolls were identified within the upper riparian zones of Granger Canyon. The scattered conifer sites were mapped as having Typic Cryoborolls. ( Hobble Creek / Diamond Fork - Land System Inventory, 1976 )

P. Geologic Types: Most of the burned-area had wildland soils derived from Bridal Veil Limestone, Flagstaff Limestone or Kirkham Limestone. The private lands and NFS lands in Granger Canyon were formed from calcareous sediments of the North Horn geologic formation. A few isolated areas near the mouth of Dry Canyon had deposits of sandstone interbedded with limestone for the parent rock. (Data Source: ( Utah Geological and Mineral Survey, 1980 )

Q. Miles of Stream Channels by Order or Class: Within the fire perimeter there were 0 miles of perennial streams; however, there are 4.4 miles of perennial stream (Right Fork Hobble Creek – Days canyon – Dry Canyon) immediately adjoining downslope of the fire perimeter. There are about 48.1 miles of intermittent/ephimeral streams within the fire perimeter. These are listed by drainage and order below:

- Left Fork Hobble Creek

Zero:	1st:	2nd:	3rd:	4th:	5th:
-0-	14.1	7.2	2.7	1.8	-0-

- Right Fork Hobble Creek

Zero:	1st:	2nd:	3rd:	4th:	5th:
-0-	12.0	7.9	1.9	0.5	-0-

R. Transportation System

Trails: <u>0.5 miles (total)</u>	Roads: <u>3.00 miles (total)</u>
<u>0.5 miles (USFS)</u>	<u>0.625 miles (USFS - FSR #058)</u>
<u>0.0 miles (non-USFS)</u>	<u>2.375 miles (Private)</u>

**PART III - WATERSHED CONDITION**

A. Burn Severity (acres):

NFS lands: <u>2,582 (55%)</u> low	<u>1,956 (42%)</u> moderate	<u>119 (3%)</u> high
Private lands: <u>558 (41%)</u> low	<u>802 (58%)</u> moderate	<u>17 (1%)</u> high
All lands: <u>3,140 (52%)</u> low	<u>2,758 (46%)</u> moderate	<u>136 (2%)</u> high

B. Water-Repellent Soil (acres): 1,324 ac. on NFS lands (28% of NFS burned area)

NFS lands: <u>258</u> low	<u>977</u> moderate	<u>89</u> high
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C. Soil Erosion Hazard Rating (acres):

<u>3,166 (68%)</u> low	<u>1,117 (24%)</u> moderate	<u>372 (8%)</u> high
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D. Erosion Potential: The numbers shown below are simply an estimate of soil erosion based upon a computer model ( USDA-NRCS/RUSLE Model ). The actual amounts can vary significantly from the information being presented in this report. The amounts shown below should only be used to compare the magnitude of change in erosion potential - rather than, actual predicted amounts.

Pre-Burn Conditions  
0.19 to 1.67 tons/acre/year

1st Year ... Post-Fire Conditions  
2.9 to 25.7 tons/acre/year

E. Sediment Potential: 9,138 tons / square mile ( Based on USDA-NRCS RUSLE Model )

**PART IV - HYDROLOGIC DESIGN FACTORS**

A. Estimated Vegetative Recovery Period, (years):	<u>2-5 yrs.</u>
B. Design Chance of Success, (percent):	<u>80%</u>
C. Equivalent Design Recurrence Interval, (years):	<u>2 yr.</u>
D. Design Storm Duration, (hours):	<u>0.5 hr. (30 minutes)</u>
E. Design Storm Magnitude, (inches):	<u>0.43 in.</u>
F. Design Flow, (cubic feet / second/ square mile):	<u>199-294 cfs/mi<sup>2</sup></u>
G. Estimated Reduction in Infiltration, (percent):	<u>28%</u>
H. Adjusted Design Flow, (cfs per square mile):	<u>289-374 cfs/mi<sup>2</sup></u>

## **PART V - SUMMARY OF ANALYSIS**

### **A. Describe Watershed Emergency:**

- **THREATS TO HUMAN LIFE AND PROPERTY** - The fire burned through several drainages that are inherently prone to debris flows. Forest Road # 058 traverses the debris fans at the bottoms of several of these. The risk of debris flows will be greater than normal for the next 1 to 3 years due to the fire related loss of soil cover and surface roughness. The Right Fork Hobble Creek runs parallel to and crosses FSR #058. This road is a heavily used arterial route accessing privately-owned lands and a large area of the Uinta NF. This road corridor is an important and heavily used recreational area (both dispersed and developed). An intense thunderstorm could trigger debris flows that could hit moving traffic and parked vehicles or could block exit points out of the watershed. Road #058 is an at-risk resource value that also creates risks to human safety, water quality and aquatic resources due to stream crossings that may have inadequate capacity to pass post-fire storm flows.
- **ISSUES RELATED TO WATER QUALITY** - The tributaries to the Right Fork have steep channel gradients and insufficient distance between the canyon mouths and the stream to detain and store eroded sediments and debris. The elevated potential for debris flows and surface erosion threatens water quality for sensitive Bonneville cutthroat trout and an irrigation water source (per Reese Pope phone call 5/27/04 with Springville City Public Works, Russell Vest).
- **LOSS OF SOIL PRODUCTIVITY** - Most soils within the high severity burn zones and approximately half the soils in the moderate severity burn zones exhibit a moderate to high degree of hydrophobicity at sampling depths of 1 to 2 inches below the ground surface. Most soils within the burned area are moderately erosive. Prior to the burn, the maximum soil loss thresholds are estimated from 0.19 to 1.67 tons/acre/yr (NRCS/RUSLE soil erosion model) within the Granger Mountain area. After the burn, first year soil losses are estimated from 2.9 to 25.7 tons/acre/yr. This is an increase of 15 times the pre-burn erosion rates. These elevated soil loss estimates exceed UIF Forest Plan and Region 4 Soil Quality standards (FSH 2509.18-2), beyond which there will be long-term losses to soil productivity and hydrologic function.

The southwest corner of the burn is characterized with long, very steep slopes ( > 70 % ) that have both HIGH and MODERATE burn severity areas located within long, straight shallow interfluvies and ephemeral drainages. These long, straight very steep slopes drain from NFS lands, across private lands, and then directly to the road and the Right Fork Hobble Creek above Cherry Campground and Days Canyon trail and trailhead. Pre-fire favorable physical characteristics of the native soils here have been compromised, and now express moderate to high hydrophobicity. Coupled with long, straight, very steep slopes, these hydrophobic soils are at extreme risk for erosion and runoff. The ephemeral drainages were noted to be loaded with sediment and debris, which with enough high energy runoff, hold a significant risk for producing debris flows, fed from the hydrophobic surfaces. This could adversely affect water quality and Bonneville cutthroat habitat and fish in the Right Fork Hobble Creek. FSR #058 users, recreationists in Right Fork Hobble Creek corridor including Days Canyon Trail and Cherry Campground users, and private lands in the Right Fork Hobble Creek.

- **NOXIOUS WEEDS and INVASIVE PLANT SPECIES** - The loss of vegetative cover and soil disturbance caused by the fire and suppression efforts has opened up an " invasion window " for colonization by noxious weed species in previously uninfected areas. A comprehensive inventory of pre-burn noxious weed infestations in the burn area is not available, but the area was known to have localized infestations of the following species.

The limited detailed data available indicates a known infestation of about 14 acres of whitetop is present within the burned area perimeter.

**Canada thistle** ( *Cirsium arvense* ) - Most common in riparian zones.

**Musk thistle** ( *Carduus nutans* ) - Most common along roads and trails.

**Dalmation toadflax** ( *Linaria genistifolia* ) - Widely scattered in uplands

**Cheatgrass** ( *Bromus tectorum* ) – Found in numerous isolated small patches in grass/forb communities, primarily along the perimeter of the burn.

**Hoary Cress** ( aka Whitetop ) ( *Cardaria draba* ) – Found in several small patches, primarily known (could be elsewhere too) to occur along Right Fork Hobble Creek.

**Tamarisk** ( aka Salt Cedar ) ( *Tamarix sp.* ) – Found in patches, primarily along stream courses, within the Right Fork Hobble Creek drainage.

**Russian Olive** ( *Elaeagnus angustifolia* ) – Found in patches, primarily along stream courses, within the Right Fork Hobble Creek drainage.

B. Emergency Treatment Objectives: **The primary objective of the BAER Team was to recommend prompt actions deemed reasonable and necessary to effectively protect, reduce or minimize significant threats to human life and property and prevent the unacceptable degradation of both soil and water resources. The emergency treatments being recommended are designed to maintain Regional and Forest Plan standards for long-term soil productivity and achieve the objectives outlined below:**

- **Treat severely burned hillslopes that pose a threat to human life, property, and important natural resources (e.g. Bonneville cutthroat trout and their habitat), and where fire-induced erosion would result in unacceptable degradation of soil and water resources.** This would be accomplished by promoting the recovery of hydrophobic soil conditions through vegetative establishment on severely burned areas, increasing ground cover on these areas to reduce overland flow rates and accelerated erosion.
- **Mitigate the risk of flood events to human life, property, and important recreational resources (e.g. Cherry Creek Campground and Right Fork Hobble Creek Road).** This would be accomplished by restricting public access to at risk heavily used concentrated dispersed recreation use locations, installing signing to inform the public of potential flooding and debris flow hazards, installing V-mesh fencing across ephemeral channels to slow or stop debris before it can reach the Right Fork Hobble Creek Road and Right Fork Hobble Creek, and replacing the Cherry Creek Campground/Right Fork Hobble Creek culvert. The Cherry Creek Campground culvert should be replaced because closure of the campground is not an economically or socially viable alternative and its capacity, safety and integrity could be exceeded or severely compromised by a 2-year post-fire runoff event.
- **Retard the invasion of weed species into the fire area.**

~~**•Provide a long-term monitoring plan with recommendations to provide for adaptive management to ensure the success of rehabilitation efforts.**~~

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

Land **80** % Channel **70** % Roads **80** % Other **95** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	65	75	80
Channel	70	80	90
Roads	85	90	95
Structures	95	95	95

E. Cost of No-Action (**Including Potential Loss**): **Potential damage to FS Road # 058 located along the Right Fork Hobble Creek; potential damage to the private lands located both within, and in close proximity, to the burned-area; problems associated with the intake pipes which take surface water for irrigation out of both Forks of Hobble Creek; potential flooding hazard to the user's of the FS Cherry Campground; potential problems with the trail going up Dry Canyon for both the Livestock permittee and visitors to the Forest; expansion of noxious weeds and other undesirable plants; issues related to a loss of long-term soil productivity on NFS lands ... \$829,560.**

F. Cost of Selected Alternative (Including Loss): **\$525,780.**

G. Skills Represented on Burned-Area Survey Team:

**The assessment team included 4 BAER Trainees and specialist consultants.**

[3] Hydrology	[3] Soils	[ ] Geology	[1] Range
[1] Forestry	[1] Wildlife	[ ] Fire Mgmt.	[1] Engineering
[ ] Contracting	[1] Ecology	[1] Botany	[1] Archaeology
[1] Fisheries	[ ] Research	[ ] Landscape Arch	[2] GIS
[1] Recreation Management			

Team Leaders:

- **Mike Smith, Soil Scientist, Fishlake National Forest**  
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- **Wm. Reese Pope, Ecosystem and Planning Group Leader, Uinta National Forest**  
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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:** Two alternatives were considered (see the following table). Alternative 2 was selected by the Uinta NF and BAER Team as the recommended alternative. Alternative 1 was not selected because the BAER Team and UIF determined that although the additional treatments would help prevent spread of noxious weeds and would maintain soil productivity and water quality; these treatments were not warranted based on the values at risk, and/or not congruent with policy regarding treatment of existing conditions (i.e., existing undesirable weed infestations).

Alternative 2, the Recommended Treatment, calls for treatment of 120 acres of severely burned terrain with aerial mulching of straw at a rate of 1 to 1.5 tons/acre to protect FSR #058 located along the Right Fork Hobble Creek (\$109,200) and conducting aerial seeding on 120 acres of steep to very steep terrain located above the Right Fork Hobble Creek using Mix # 1



(\$12,000). These treatments would decrease potential surface soil erosion and sediment delivery to stream channels. These treatments would reduce fire related impacts to water quality, protecting the culinary water supply, Bonneville cutthroat, and riparian / aquatic habitat. The costs for these treatments include rental fee for using a small tract of private land needed to conduct helicopter operations for a week (\$1,440). In addition, Alternative 2 includes treatment of about 50 acres of new noxious weed infestations within the burned area (\$5,000).

Treatment	Alternative 1	Alternative 2 – Recommended
	(Acres)	(Acres)
Aerial Seed (NFS lands only)	431	120
Aerial Mulching	152	120
Non-Native Invasive Plant Control (Noxious Weeds)	329	50
<b>Total Treated Area</b>	329 <sup>1/</sup>	170 <sup>1/</sup>

<sup>1/</sup> Numbers above overlap so total acres can not be added from above table.

Seed Mix # 1 - Used for Mid-Elevation Landscapes ( 5,500 to 7,000 Feet			
Plant Species <sup>1/</sup>	Pounds PLS/Acre	Cost/Pound	Cost/Acre
Sterile Triticale	30	\$ 1.25	\$ 37.50
Mountain Brome	4	\$ 1.75	\$ 7.00
SlenderWheatgrass	4	\$ 1.60	\$ 6.40
Blue Wildrye	0.5	\$ 3.40	\$ 1.70
Sandberg Bluegrass	1.5	\$ 4.30	\$ 6.45
Thickspike Wheatgrass	2	\$ 2.25	\$ 4.50
<b>Total Seed Cost</b>			<b>\$63.60</b>
Misc. Supplies			<b>\$0</b>
<b>Application Costs (helicopter, ground crew support, helibase rental, etc.) <sup>2/</sup></b>			<b>\$36.40</b>
<b>Total Seed and Supplies Cost</b>			<b>\$100.00</b>

<sup>1/</sup> One possible substitute species that might be considered in this seed mix would be using Fowl Bluegrass at a rate of 1.5 lbs / acre; the current cost of this species is \$ 3.25 / lb.

<sup>2/</sup> Based on experience of numerous helicopter seeding operations on UIF over the last 5 years, considering operations within a steep canyon area.

This seed mix was developed to: 1) provide a quick ground cover for stabilizing conditions within high burn severity areas, 2) break up hydrophobic soil conditions on severely burned sites, 3) reduce sediment transport from the burned-area, 4) reduce impacts to downstream water quality and aquatic habitats, 5) provide vegetative cover to reduce the risk of invasion by undesirable species (e.g. noxious weeds), and 5) follow 2003 UIF Forest Plan direction for vegetation management including requirements to use native species. Sterile triticale, a non-native species, was selected because it is sterile, and has been shown to be effective in providing short-term ground cover. The remaining species are native species that can provide both short- and long-term ground cover. This mix was selected to provide short- and long-term soil protection, a diversity for wildlife, and comply with UIF Forest Plan direction.

**Total cost for the Recommended Land Treatments ... \$ 126,200**

**Channel Treatments:** The south facing tributaries of Right Fork Hobble Creek are very steep and naturally prone to debris flows. Forest Service Road #058, which traverses the alluvial fans of these channels, is a value at risk if post-fire debris flows occur. The BAER Team recommends installation of V-mesh fence across 3 of these ephemeral channels. Initially the BAER Team identified a need to construct about 5,800 feet of V-mesh fence, but after further analysis reduced the amount recommended to an estimated 1,080 feet. The objective of V-mesh fencing is to potentially stop or slow debris before it hits the transportation surface or adjacent parking areas. In some cases, past debris flow channels flow directly into parking areas adjacent to the road. These sites could be closed temporarily with buck and pole fencing (see Structures section below). Signage informing the public of potential flooding & debris flow hazards above, below, and throughout the FS #058 transportation corridor (see Structures section below).

**Total cost for the Recommended Channel Treatments ... \$ 16,200**

**Roads and Trail Treatments:** Two alternatives were considered (see the following table). Alternative 2 was selected by the Uinta NF and BAER Team as the recommended alternative. Although the additional treatments would benefit stream channel and road integrity and safety, Alternative 1 was not selected. Modeled flows and estimated culvert capacities for Dry Fork indicated that the existing structure would pass Post-fire flows generated from a 100 year storm. Similarly, the culvert above Kirkman Hollow would pass flows from 25 - 50 year storms. In addition, the Uinta NF had already tentatively scheduled one of the considered treatments (culvert near Kirkman Hollow) for replacement in 2005.

Road Treatment	Alternative 1	Alternative 2 – Recommended
	(Estimated \$)	(Estimated \$)
Dry Canyon/FSR #058 culvert	\$39,800 <sup>1/</sup>	\$0
FSR #058/Right Fork Hobble Creek culvert – near Kirkman Hollow	\$94,600 <sup>1/</sup>	\$0
Cherry Creek Campground/Right Fork Hobble Creek culvert	\$86,000 <sup>1/</sup>	\$86,000 <sup>1/</sup>
<b>Total Treated Area</b>	<b>\$220,400 <sup>1/</sup></b>	<b>\$86,000 <sup>1/</sup></b>

<sup>1/</sup> Per phone direction from R4 BAER Coordinator Jeff Bruggink, costs should be the minimum to address the emergency and consequently, should not include reapplication of asphalt on the road surface unless it would compromise the structure or create unsafe conditions to do so. Therefore, these costs do not include replacement of asphalt surfacing. Instead aggregate surfacing would be provided over these culverts (roads are asphalted). The engineers estimate indicates the cost of replacing the asphalt would be about \$2,500 - \$3,400 (in addition to what is shown above) at each location.

Post-fire modeling of storm flows indicates there is a HIGH potential to exceed the capacity of the Cherry Campground Right Fork Hobble Creek crossing. Calculations were based on modeled flows and estimated culvert capacity. Water velocities for culvert capacity were estimated based on a bank stability threshold and maximum conveyance ( see Water Resources and Roads Reports ). To maintain a stable channel, the Cherry Campground culvert can pass an estimated 270 to 320 cubic feet per second ( cfs ). Maximum culvert conveyance was estimated at 390 cfs. Pre-fire modeling results show the culvert would pass flows from a 50-year storm event ( 397 cfs ). In post-fire modeling, similar flows ( 376 cfs ) are generated from a two-year storm. Thus, the maximum culvert capacity could be exceeded in any precipitation event greater than a two-year event. In addition, the 2002 bridge inspection identified scoured footings and deteriorating structural integrity. Culvert replacement would reduce potential risks to public safety, water quality and aquatic resources.

**Total cost for the Recommended Road and Trail Treatments ... \$86,000**

**Structures:** Two alternatives were considered (see the following table). Alternative 2 was selected by the Uinta NF and BAER Team as the recommended alternative. Tributary 3 enters the Right Fork Hobbie Creek immediately above a culvert road crossing. Debris flows generated from this watershed could plug the intake and contribute to culvert failure. Construction of a small diversion or berm at the head of this alluvial fan would redirect the debris flow path away from the culvert and down a historic channel that has a longer run out to the road and a large open area to dissipate energy. Although the additional treatment would benefit stream channel and road integrity and safety, Alternative 1 was not selected. Modeled flows and estimated culvert capacities for the Culvert above Kirkman Hollow would pass flows from 25 - 50 year storms. In addition, the Uinta NF had already tentatively scheduled one of these treatments (culvert near Kirkman Hollow) for replacement in 2005.

Structure Treatment	Alternative 1	Alternative 2 – Recommended
	(Estimated \$)	(Estimated \$)
Signs	\$2,000	\$2,000
Buck and Pole Fence	\$1,500	\$1,500
FSR #058/Right Fork Hobbie Creek culvert – near Kirkman Hollow	\$3,000	\$0
Total Treated Area	\$6,500	\$3,500

The south facing tributaries of Right Fork Hobbie Creek are very steep and naturally prone to debris flows. In some cases, past debris flow channels flow directly into day-use parking/dispersed recreation sites adjacent to the road. To protect recreation users from potential flood/debris flow events, the BAER Team recommends constructing buck and pole fence (\$1,500) to temporarily close 2 of these day-use parking/dispersed recreation sites. These sites will be re-opened when the surrounding hillsides resume a normal type of Hydrologic Function once again (estimated cost of about \$400, to be requested in the future through an interim report if/when this is desired).

Forest Service Road #058, which traverses the alluvial fans of the Right Fork Hobbie Creek tributaries, is a value at risk if post-fire debris flows occur. The BAER Team recommends placement of signs at 5 locations to inform visitors and road users of potential flooding & debris flow hazards above, below, and throughout the FS #058 transportation corridor (\$2,000).

**Total cost for the Structure Treatments ... \$3,500**

**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.)

Monitoring is the periodic assessment of BAER treatments to evaluate their success and/or failure, recommend adjustments to treatments and report on these findings to management. Forest Service Manual 2523.03 directs that the implementation and effectiveness of treatments, as well as the consequences of decisions not to treat certain areas, will be monitored. Forest Service Handbook 2509.13, Section 61.1 requires that, as a minimum, the following conditions be monitored:

- The effectiveness and proper functioning of stabilization measures, especially road drainage facilities and channel structures.
- Need for re-treatment, maintenance and removal of temporary structures.

- Quality and quantity of water leaving the burned area and the location and causes of problems.
- Rate of recovery of vegetation.
- Effects of resource utilization, restoration activities and emergency stabilization measures on each other.

The BAER Team has prepared a detailed Monitoring Plan, and this is summarized below. The total estimated cost of Year 1 monitoring detailed in this plan is \$7,680. Nearly all costs identified in the monitoring plan are for Effectiveness Monitoring. The treatment implementation monitoring is included as costs for individual treatments. There is a small amount of funding requested for monitoring the implementation of the project. This includes assessing the timing, schedules and coordination of the implementation team. For more detail, refer to the detailed Monitoring Plan.

1. **Implementation Monitoring:** The purpose of implementation monitoring is to determine if the treatments were conducted as prescribed. Some of the critical implementation questions to be monitored are:

- Were the materials (e.g., seed, straw, etc.) of appropriate quality?
- Were the treatments conducted when, where, and how planned (e.g. in the appropriate locations, densities, etc.)?
- Were appropriate water quality and noxious weed Best Management Practices employed during implementation?
- What were the costs of the treatments?

2. **Effectiveness Monitoring:** This monitoring is designed to answer the question: Did the BAER treatments provide the planned protection and stabilization of the burned area? Said another way, have the objectives of the treatments been met and if not, why? Per the Forest Service Handbook (2509.13, 62.23), this monitoring includes on-the-ground review by a team of emergency response specialists, normally 2-3 growing seasons after the burn but may also be after the first runoff season or after unusual climate. Both successes and failures are to be addressed, along with reasons. Sensitive areas are given priority. Some questions to be addressed in effectiveness monitoring include:

- Did the seeding result in timely re-establishment of vegetative cover, and did this stabilize the soil?
- Did the mulching facilitate revegetation, and reduce erosion?
- Did the V-mesh fence reduce the debris and sediment washing from the burn area onto FSR #058, dispersed recreation sites, and Right Fork Hobble Creek?
- Did the new culvert at Cherry Campground effectively handle runoff events?
- Did the treatments reduce or eliminate adverse impacts to water quality and fisheries habitat in Right Fork Hobble Creek?
- Was vegetative recovery of the various vegetation types as predicted?
- Did the treatments restrict the spread of undesirable plant species?

**Interim Evaluations:** An annual accomplishment report will be completed at the end of FY 2004. An annual monitoring report will be submitted at the end of 1 calendar year following the containment of the fire. Any need for additional monitoring beyond 1 year will be identified in the annual monitoring report. The forest BAER Team Leader will conduct periodic evaluations (annually as a minimum) with the District and Forest implementation team to assess implementation progress, effectiveness, and costs, and to determine if additional treatments or monitoring are warranted. An interim report summarizing the results will be prepared annually. The total estimated monitoring cost for Year 1 is \$ 7,680. - \$ 8,230 for Year 2; and \$ 8,180 for Year 3. Costs for the first year are higher because of program initiation and establishing the monitoring sites.

**Total cost for the Year 1 Monitoring and Reporting ... \$7,700**

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

Line Items	Units	Unit Cost	NFS Lands				Other Lands				Total
			# of Units	WFSU SULT \$	Other \$		# of units	Fed \$	# of Units	Non Fed \$	
<b>A. Land Treatments</b>											
<> Aerial Seeding	Acre	100	120	\$12,000	\$0			\$0		\$0	\$12,000
<> Aerial Mulching	Acre	910	120	\$109,200	\$0			\$0		\$0	\$109,200
<> Weed Treatment	Acre	100	50	\$5,000	\$0			\$0		\$0	\$5,000
<i>Insert new items above this line!</i>				\$0	\$0			\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				<b>\$126,200</b>	<b>\$0</b>			<b>\$0</b>		<b>\$0</b>	<b>\$126,200</b>
<b>B. Channel Treatments</b>											
<> V-Mesh fence	feet	15	1080	\$16,200	\$0			\$0		\$0	\$16,200
<i>Insert new items above this line!</i>				\$0	\$0			\$0		\$0	\$0
<i>Subtotal Channel Treat.</i>				<b>\$16,200</b>	<b>\$0</b>			<b>\$0</b>		<b>\$0</b>	<b>\$16,200</b>
<b>C. Road and Trails</b>											
<> Cherry CG Culvert	job	86000	1	\$86,000	\$0			\$0		\$0	\$86,000
<i>Insert new items above this line!</i>				\$0	\$0			\$0		\$0	\$0
<i>Subtotal Road &amp; Trails</i>				<b>\$86,000</b>	<b>\$0</b>			<b>\$0</b>		<b>\$0</b>	<b>\$86,000</b>
<b>D. Structures</b>											
<> Warning Signs	sign	400	5	\$2,000	\$0			\$0		\$0	\$2,000
<> Buck-Pole Fence	barrier	750	2	\$1,500	\$0			\$0		\$0	\$1,500
				\$0	\$0			\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0			\$0		\$0	\$0
<i>Subtotal Structures</i>				<b>\$3,500</b>	<b>\$0</b>			<b>\$0</b>		<b>\$0</b>	<b>\$3,500</b>
<b>E. BAER Evaluation</b>											
<> Salary	day	3600	6.5	\$23,400	\$0			\$0		\$0	\$23,400
<> Team Travel	day	120	12	\$1,440	\$0			\$0		\$0	\$1,440
<> Helicopter Daily	day	2379	2	\$4,758	\$0			\$0		\$0	\$4,758
<> Helicopter Use	hour	693	5.4	\$3,742	\$0			\$0		\$0	\$3,742
<> Supplies	job	1000	1	\$1,000	\$0			\$0		\$0	\$1,000
<i>Insert new items above this line!</i>				\$0	\$0			\$0		\$0	\$0
<i>Subtotal Evaluation</i>				<b>\$34,340</b>	<b>\$0</b>			<b>\$0</b>		<b>\$0</b>	<b>\$34,340</b>
<b>F. Monitoring</b>											
<> Annual Report	report	7700	1	\$7,700	\$0			\$0		\$0	\$7,700
<i>Insert new items above this line!</i>				\$0	\$0			\$0		\$0	\$0
<i>Subtotal Monitoring</i>				<b>\$7,700</b>	<b>\$0</b>			<b>\$0</b>		<b>\$0</b>	<b>\$7,700</b>
<b>G. Totals</b>				<b>\$273,940</b>	<b>\$0</b>			<b>\$0</b>		<b>\$0</b>	<b>\$273,940</b>

**PART VI - APPROVALS**

1. /s/ Kim J. Martin (for)  
Forest Supervisor (signature)

May 28, 2004  
Date

2. /s/ William P. LeVere for June  
3,2004 Regional Forester (signature) Date