Edited J.Bruggink 08/31/2005 Date of Report: August 23rd, 2005

USDA - FOREST SERVICE / BURNED - AREA REPORT

(Reference FSH 2509.13)

PART 1 … TYPE of REQUEST

A. Type of Report

(X) 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)

(X) 2. Interim Report
(X) Updating the initial funding request based on more accurate site data and design analysis
(X) Status of accomplishments-to-date

( ) 3. Final Report - following completion of the emergency work

PART 2 … BURNED - AREA DESCRIPTION and FIRE LOCATION

A. Fire Name: Cottonwood
B. Fire Number: P44123 / UT - FIF – 242
C. State: Utah
D. County: Piute … # 031
E. Region: R4 / Intermountain
F. Forest: Fishlake … # 0408
G. District: D3 / Beaver
H. Date Fire Started: 08-19-2002 @ 1500
I. Date Fire Contained: 08-31-2002 @ 2000
J. Date Fire Controlled: 09-03-2002 @ 1800

K. Suppression Costs: $ 735,000 (cost-to-date) … ICS - 209 / 09-02-2002

L. Fire Suppression Damages Repaired with EFFS – PF12 Funds:

- Fireline Waterbarred (miles) ~ 1 mile of hand lines and 5½ miles of dozer lines
- Fireline Re-seeded (miles) ~ 1 mile of hand lines and 5½ miles of dozer lines
- Other Damages … (identify) ~ 1½ miles of waterline having 1¼ inch pipe; 2 additional lateral waterlines - both with 50 feet of pipe and ~ 2 acres at Helibase

M. Subwatershed Numbers: 160300030107 / Cottonwood Creek and 160300030109 / Pine Creek

N. NFS Acres Burned: 1,080 **Total Acres Burned:** 1,520

Other Land Ownerships … list as follows (acres):

(X) Private - 440 ( ) State of Utah - 0 ( ) BLM – 0 ( ) DWR – 0

O. Vegetation Types:	Mixed conifers including Englemann spruce, Subalpine fir, Douglas fir and scattered White fir trees were found on High Mountain ecological sites along steep ridgetops, mountainsides and intermixed with talus deposits of limestone and quartzite (70 %). Curlleaf mountain-mahogany dominated areas of lower elevations on canyon walls, rock outcrops and stony upland foothills (27 %). Small areas of pinyon - juniper / grass vegetative communities in a seral stage of development were mapped in the lowest elevation areas of the burn on structural benches and alluvial fan terraces (2 %). Finally, a few distinct pockets of subalpine type vegetation (perennial grasses and forbs) were found at the highest elevations within the perimeter of the burned-area on mountain summits near 11,000 feet (1 %). *(Fishlake National Forest / GIS Database)*
P. Dominant Soils:	The soils occurring on the lowest elevations within the burned-area were found to have both mesic and frigid temperature regimes; these sites were mapped as being Xerollic Calciorthids, Aridic Calcic Argixerolls, Aridic Argixerolls and Aridic Calcixerolls. Middle elevation areas that had supported curlleaf mountain-mahogany were recognized as Lithic Cryoborolls and Argic Cryoborolls -- when annual and perennial grasses occurred within the understory. The high elevation mixed conifer landscapes had soils identified as being Pachic Cryoborolls, Argic Cryoborolls, Typic Cryochrepts or Typic Cryorthents. While the subalpine vegetative plant communities were found on soils classified as Pachic Cryoborolls or Lithic Cryoborolls. *(Fishlake National Forest / GIS Database)*
Q. Geologic Types:	The burned-area has a variety of wildland soils derived from Indianola Conglomerate, Miocene and Sevier River Volcanics and quartzite on steep talus slopes; a few scattered outcrops of limestone occur at the summit of Deer Trail Mountain and mixed sediments of alluvium were deposited on the lower fan terraces. *(Utah Geological and Mineral Survey - SGID Files, 1980)*

R. Miles of Stream Channels by Order: (Strahler 1952 method, within the fire perimeter)

Zero: -0- 1st: 4.0 2nd: 1.2 3rd: -0- 4th: -0- 6th: -0-

S. Transportation Systems: (occurring within the fire perimeter)

Trails … 0 miles (USDA - Forest Service)
Trails … 0 miles (Private Ownership)
Trails … 0 miles (BLM Lands)

Total Trails … 0 miles

Roads … 2.0 miles (USDA - Forest Service)
Roads … 1.2 miles (Private Ownership)
Roads …… 0 miles (BLM)
Roads …… 0 miles (State of Utah)
Roads …… 0 miles (UDWR - Wildlife Reserves)

Total Roads … 3.2 miles

PART 3 … WATERSHED CONDITION / NFS PROBLEM INVENTORY

A1. Mapping of the Burn Severity Zones: (1,520 total acres occurring within the perimeter of the Cottonwood Fire)

481 High (32 %) 327 Moderate (22 %) 712 Low / Unburned (46 %)

A2. Mapping of the Burn Severity Zones: (NFS lands … 1,080 acres)

289 High (27 %) 239 Moderate (22 %) 552 Low / Unburned (51 %)

B. Estimation of Water-Repellent soils occurring within the different Burn Severity Zones:
(NFS lands … 1,080 acres)

246 High (85 %) 108 Moderate (45 %) 28 Low / Unburned (5 %)

Overall Total = 382 acres

C. Rating Soils for Potential Erosion Hazards within the Fire Perimeter: (NFS lands … 1,080 acres)

High	Moderate	Low
410 (38 %)	184 (17 %)	486 (45 %)

D. Potential for Accelerated Erosion Losses without applying emergency rehabilitation treatments:

1st Year	2nd Year	3rd Year	4th Year
29.8 tons/acre/year	4.6 tons/acre/year	1.7 tons/acre/year	0.05 tons/acre/year

Overall Total = 77,419 tons

(additional erosion over a 48 month period)

(Source) – Disturbed WEPP model … http://www.forest.moscowfsl.wsu.edu/fswepp/

E. Total Sediment Potential: 16,299 tons / mile ^{2} … according to the Disturbed WEPP Model

(**NOTE**) – the sediment entry assumes a 40 % delivery efficiency for a period of 4 years

PART 4 … HYDROLOGIC DESIGN FACTORS with CALCULATED RISK and CLIMATE EVALUATIONS

The following table shows the average factors for the North Tributary above Deer Trail Mine:

A. Estimated Vegetative Recovery Period: 10 years
B. Design Chance of Success: 70 percent
C. Equivalent Design Recurrence Interval: 10 year
D. Design Storm Duration: 1 hour
E. Design Storm Magnitude: 1.1 inches
F. Design Flow: 26.5 ft^3 / sec / mi^2
G. Estimated Reduction in Infiltration: 27 percent
H. Adjusted Design Flow: 61 ft^3 / sec / mi^2

PART 5 … SUMMARY OF SURVEY & ANALYSIS

A1. Status of Accomplishments-to-Date:

- 372 acres of broadcast seeding were completed on severely burned terrain during September of 2002 using a Type III helicopter; UDWR did not contribute any shrub seed to our different seed mixes; the seed was not tested for purity with respect to measuring invasive plant species and weeds; however, it was certified to be free of noxious weeds; germination rates according to the ID tags sewn into the bags were about 88 to 95 % -- depending upon the different grass species; the folks located at the RIFC / Fire Dispatch helped us with the storage of our seeds bags – at no cost to government.

- Aerial mulching was completed on 57 acres of NFS lands using a Type III (A-Star) helicopter with the help of the Provo Helitack Crew during September and October of 2002.

- To my understanding, the suggested road closure gates (2) were never purchased by the Ranger District

- Explanatory signs were finally purchased and displayed by the Ranger District after several accidents occurred within the burned-area. The signs were purchased in 2003 and posted in 2003 and 2004.

- Year 1 monitoring activities were completed by the District Staff and Resource Specialists working for the Fishlake NF in 2002 – 2003, this information was subsequently reported in our Fishlake NF / BAER Monitoring and NFP / KP2 Projects for the Mourning Dove – Yance Canyon, Oldroyd and Swains Fires of CY 2000 – and, Cottonwood and Johnson Fires of CY 2002.

- Year 2 monitoring activities were completed by the District Staff and Resource Specialists working for the Fishlake NF in 2003 – 2004.

- Our Forest Rangeland Management Specialist / Doug Sorensen made an inventory of all noxious weeds occurring within the burned-area, NFN3 funds were used in subsequent years to eradicate these unwanted plant populations.

A2. Describe the Watershed Emergency as it exists at this time:

Much the same as the Johnson Fire, this burned-area has continued to experience several episodes of flooding with significant mudslides each year since the unwanted wildfire took place in 2002. Often times, flood waters will continue flowing off the severely burned terrain and end-up infiltrating along the fringe of several alfalfa fields (irrigated cropland areas) located on private lands about 1¾ miles NE of the incident.

The mudslides have interfered with the on-going operations of the Old Deer Trail Mine – preventing their re-processing of mine tailings or the secondary recovery of gold and silver. The burn remains a hazard for anyone riding their ATVs within the immediate area on nearby BLM or private lands. Members of the Beaver Ranger District have been doing field inventories for noxious weeds – especially, musk thistle and Russian knapweed; eradications have been financed using NFN3 dollars.

Simply stated, the Resource Specialist's from the Fishlake NF want to study the burned-area one more time to look at the usefulness of the BAER treatments, to see how the new BARC image lines-up with severely burned areas observed on-the-ground and to assist the District with identifying more areas of noxious weeds.

(Note) … both the Cottonwood and Johnson Fires requested – but never actually received, BARC images of their original burns. Cloudy weather conditions prevented our LandSat technology from acquiring these satellite images during September of 2002. So … we would like to acquire new BARC scenes for these burns in order to determine how much of the initial disturbance remains a severely burned landscape and susceptible to flooding or debris flow hazards at this time.

B. Monitoring Objectives:

We need to complete Year 3 of our monitoring activities. Then we can prepare a brief report for the Forest and Region which identifies our success and failures with respect to implementing successful BAER treatments intended to stabilize ground conditions within the burned-area. Our document preparation fee was estimated to be about $ 500 … the BAER Team will need about 5 days of time to accomplish this task.

(Note) – during the preparation of this report, the Monitoring Plan was **updated** to reflect changes in the BAER program, to correct minor mistakes in the original document and to refine the cost estimates shown on the financial table for Year 3.

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

Land … 85 % Channel … N / A Roads … N / A RAWS … N / A Archeology … N / A

D. Probability of Accomplishing Treatment Success:

< ---------- Years after Treatment ---------- >

	1	3	5
♦ **Land**	**75 %**	**80 %**	**85 %**
♦ **Channel**	**N / A**	**N / A**	**N / A**
♦ **Roads & Trails**	**N / A**	**N / A**	**N / A**
♦ **Other … RAWS**	**N / A**	**N / A**	**N / A**
♦ **Archeological**	**N / A**	**N / A**	**N / A**

E. Cost of Taking No-Action: (including potential loss) The Fishlake NF / BAER Team approximated the values-at-risk to be about $ 1,740,000 which includes 1) the private lands of Dr. Richard Kennedy, 2) the original Deer Trail Mine site, 3) FS Road # 125, 4) impacts to the Deer Creek Pasture of the Marysvale Allotment and 5) water quality concerns for both Cottonwood Creek and Threemile Creek.

F. Cost of the Recommended BAER Treatments on NFS Lands: (including loss) Approximately $ 275,000 since the land treatments are only expected to be about 75 % effective during the 1st year after the burn.

G. Skills Represented on the Interim / Burned-Area Survey Team:

(X) Soils	( ) Geology	( ) USDI - BLM	(X) TES … Plants
(X) Hydrology (3)	( ) Contracting	( ) TES … Wildlife	(X) Fire Dispatch
(X) Plant Ecology	(X) Helicopter Crew	( ) Timber	( ) Archeology
(X) GIS Staff	( ) Range	(X) District Staff	( ) Engineering
( ) TES … Fisheries	( ) USDA – NRCS	( ) Utah - DWR	( ) BAER Assistant

Team Leader: Michael D. Smith (Soil Scientist / Fishlake National Forest)

Phone: (435) - 896 - 9233 / ext. # 1071 **E-Mail:** mdsmith01@fs.fed.us

RECOMMENDED MONITORING ACTIVITIES

National Forest System Lands

- **Monitoring the Implementation and Effectiveness of BAER Treatments** … for 1) Soil and Water - such as monitoring for on-going water-repellent ground conditions occurring within the burned-area, examining topsoil movement and reviewing the numerous mudslides that took place in the area ($2,500); for 2) Erosion Control Measures - to review the seeding and aerial mulching treatments using 1 to 1½ tons of straw / acre ($2,335); for 3) Noxious Weeds and Invasive Plant Species (This is only allowed under year 1 Jeff Bruggink 08/31/05) – identifying areas of unwanted weeds that were stimulated by the fire event ($500) and 4) to fund Document Preparation Services with the help of the BAER Team Assistant ($500).
- **Preparation of Interim 2 Request: $495**
- **Final Monitoring Report documentation: $1650**
- **Helicopter for access to monitoring areas: $1607**
- **Team Supplies: $150**
- **RSAC Satelite Imagery: $580 (this item is an assessment cost not monitoring J.Bruggink 08/31/2005)**

Total = $ 10,317

PART 6 … EMERGENCY REHABILITATION TREATMENTS & SOURCE OF FUNDS BY LAND OWNERSHIP(s)

A. Land Treatments

| < --- **Recommended Treatments** --- > | < ------ **Suggested Treatments** ------ > |

NFS Lands **Other Lands**

Line Items	Unit Type	Unit Cost $	Number of Units	WFSU–SULT $	Number of Units	State of Utah $	UDWR $	BLM or County $	Total $
Subtotal for Section A	---	---	---	---	---	---	---	---	---

B. Channel Treatments

Line Items	Unit Type	Unit Cost $	Number of Units	WFSU–SULT $	Number of Units	State of Utah $	UDWR $	BLM or County $	Total $
Subtotal for Section B	---	---	---	---	---	---	---	---	---

C. Roads, Trails and Other Treatments

Line Items	Unit Type	Unit Cost $	Number of Units	WFSU–SULT $	Number of Units	State of Utah $	UDWR $	BLM or County $	Total $
Subtotal for Section C	---	---	---	---	---	---	---	---	---

D. Early Warning System / Remote Automated Weather Station (RAWS) and Protection of known Archeological Sites

Line Items	Unit Type	Unit Cost $	Number of Units	WFSU–SULT $	Number of Units	State of Utah $	UDWR $	BLM or County $	Total $
Subtotal for Section D	---	---	---	---	---	---	---	---	---

E1. Interim BAER Evaluation / Administrative Support Services

BAER Team Preparing our Funding Request and Interim BAER Report # 2	Team	$ 330	1.5	$ 495	---	---	---	---	$ 495

BAER Team Preparing the Final Monitoring Report	Team	$ 330	5	$ 1,650	---	---	---	---	$ 1,650
Interim BAER Team / Helicopter Flights **(Low Level)** Type III / Bell 206 L-4	Hour	$ 643	2 ½	$ 1,607	**According to our RIFC / Helibase Manager - Mr. Kevin Gappert, the new cost / hour for flight time is $ 643 – which reflects the rising cost of Jet A fuel in CY 2005.**				$ 1,607
BAER Team Supplies	Misc.	$ 150	1	$ 150	---	---	---	---	$ 150
RSAC Satellite Image - BARC	Misc.	$ 580	1	$ ---	---	---	---	---	$ 580
Subtotal for Section E1	---	---	---	$ 3,902	---	---	---	---	$ 4,482

E2. Implementation and Effectiveness Monitoring Activities

(Forest Service … Implementation and Effectiveness Monitoring - Year 3 of 3) **NOTE … if necessary, additional monitoring dollars can be acquired by the FS during Year 3 using and Interim type BAER Report to request and secure the appropriate funding; the individual to contact at the Intermountain Regional Office is Jeff Bruggink -- R4 / Soil Scientist and BAER Coordinator at (801) - 625 - 5357**									
1) Soil & Water Hydrophobic conditions, soil movement, debris flows etc.	Year 3	$ 2,500	1	$ 2,500	---	---	---	---	$ 2,500
2) Erosion Control Reviewing the seeding and mulching treatments	Year 3	$ 2,335	1	$ 2,335	---	---	---	---	$ 2,335
3) Noxious Weeds and Invasive Plant Species Cheatgrass, Thistle & Russian Knapweed	Year 3	$ 500	1	$ 0	---	---	---	---	$ 500
4) Final Document Preparing the Final BAER Report and Monitoring Document	Year 3	$ 500	1	$ 500	---	---	---	---	$ 500
Subtotal for Section E2	---	---	---	$ 5335	---	---	---	---	$ 5,835
F. TOTALS	---	---	---	**$ 9,237**	---	**-0-**	**-0-**	**-0-**	**$ 10,317**

Fund Code for Implementing Authorized BAER Treatments … H44123

PART 7 … APPROVALS

1. **Forest Supervisor: Diane Freeman, Acting for MARY C. ERIKSON_____** **Date: August 23rd, 2005**

2. **Regional Forester: _/s/ William P. LeVere for _____** **Date: _August 31, 2005 _____**

MONITORING PLAN

Introduction: Why Monitor?

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 for up to 3 years. This plan will assess BAER measures taken to assist in rapid recovery of the burned sites and nearby lands and resources affected by the burned sites. The monitoring identified below is the minimum necessary and is directly linked to the applied treatments. Direction in this monitoring plan complies with the Fishlake National Forest Land and Resource Management Plan. The Forest Service Handbook 2509.13, Section 61.1 requires that, as a minimum, the following conditions be monitored:

Conditions that should be monitored are also advised by the Handbook:

1. The effectiveness and proper functioning of rehabilitation measures, especially road drainage facilities and channel structures.
2. Need for retreatment, maintenance, and removal of temporary structures.
3. Quality and quantity of water leaving the burned area, and the location and causes of problems.
4. Rate of recovery of vegetation.
5. Effects of resource utilization and restoration activities and emergency rehabilitation measures on each other.

District and Supervisors office personnel (with any requested assistance) will be assigned by the Leadership Team to conduct the implementation and the effectiveness monitoring (FSH 2509.13 Section 61.04). All evaluations are to be documented in a written report.

Implementation Monitoring: Did the job get done correctly on-the-ground?

Determine if the following proposed treatments were implemented as outlined in the BAER report:

- ***Broadcast Seeding:*** Are the seed mixtures applied to the intended sites with the proper rates of application?

- ***Aerial straw application:*** Was work performed safely and without injury? Did ground cover meet location and extent? Did any contracts or procurement proceed in an efficient and timely manner? Was installation timely? Did costs approximate budgeted allocations?

- ***Explanatory Signs (hazard or educational types):*** Are the signs installed at the designated locations with the intended message? Was installation timely? Did costs approximate budgeted allocations?

- ***Temporary Road Closures:*** Were the gates installed as described?

Effectiveness Monitoring: Did the expected response occur?

This monitoring is specifically designed to answer the question: Did the BAER treatments provide the planned protection and rehabilitation of the burned area? Said another way, have the objectives of the treatments been met and if not, why? The purpose is NOT to prove, for example, that increased ground

cover reduces erosion; rather, it is to see if the ground cover improvement treatment was implemented and verify if ground cover is increased.

Per the Forest Service Handbook (2509.13, 62.23), this monitoring includes on-the-ground review by a team of emergency rehab specialists, normally 2 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.

Are the emergency treatments successful in:

- protecting long-term soil productivity?
- preventing the deterioration of water quality,
- reducing the threats to human life and property and allowing for the management of ecosystems in their properly functioning condition?

Specific objectives of the treatments are described below:

Broadcast Seeding: Establish vegetative cover on the site quickly to:

- ❒ stabilize severely burned soils to maintain long-term productivity and meet Regional and Forest Plan standards,
- ❒ prevent production and delivery of off-site erosion to the stream channel network,
- ❒ reduce overland flow caused by rain-drop splash that seals the soil surface,
- ❒ and suppress the spread of invasive species including noxious weeds.

Aerial straw application: (straw bombing)

- ❒ reduce raindrop splash and surface sealing of the soil (evidenced by fines at the surface), provide shade and prolonged moisture (evidenced by vegetative recovery and overland flow at surface around/under mulch), help hold soil in place on hillslopes (evidenced by lack of rill erosion below straw), and/or help offset wind erosion (evidenced by wind deposits on leeward side of mulch). Document all findings.

Explanatory Signs: Place signs as described in the treatment map to provide for public safety and promote fire recovery by communicating the potential flooding hazards and the need to adhere to motorized access restrictions.

- ❒ Signs are clearly understandable.
- ❒ Signs are placed with optimum visibility in concert with visual objectives

General Data Collection Procedures

The information to be recorded and documented will include the dates and type of emergency treatments implemented along with the total number of structures, acres and actual costs associated with these rehabilitation projects.

Photos will be taken during and after these treatments and actual treatment locations will be plotted on maps or using GPS. These photo points will be established above, within and below the various treatments. Digital photography is recommended. Regular film may be scanned so that digital reporting can be accomplished.

Any monitoring item having a specific location will be mapped using GPS and loaded into the corporate GIS database (e.g., weed infestations).

The Implementation Team leader will ensure that all data being collected meets the established standards. Data collected for inclusion into the Forest GIS database will meet corporate standards.

For all monitoring projects, as a minimum, record:

- The dates of installation or accomplishment.
- Name(s) of person(s) collecting data and name of person, organization, or contractor performing work with a lead contact name if possible.
- Types of equipment used.
- Time for project completion (length of treatment).
- GPS location as well as a detailed map and narrative of directions to the site.
- Short narrative explaining how the job was completed, any problems encountered and how they were solved.
- Recommendations for continued use of the treatment on other fire rehabilitation projects considering both implementation and effectiveness concerns.
- Evaluation of whether treatments supported the " minimum necessary " goal.

Specific Data To Be Collected

Erosion Control Seeding and Mulch:

- What were the soil moisture conditions at the time of seed application?
- What moisture events followed the seeding?
- Was seed spread uniformly over all intended treatment sites?
- Is there between 50 and 80 % soil cover to protect the soil three years post seeding?
- Which species did well?
- Which species did poorly?
- Are there any more effective ways of doing business compared with the treatment recommendations presented with the Initial Request for EFFS - FW22 funds?

Noxious Weeds, Invasive Species and Rare Plants:

- What is the response of those rare species affected by the fire?
- Is there evidence of post fire rehabilitation of burned individuals?
- Were the habitats of sensitive species avoided?
- What is the location and species of any noxious or invasive weeds present?
- Are there previously uninfected areas where noxious weed treatments are now necessary?

Interim Evaluations

The Implementation Team Leader will conduct periodic evaluations (annually as a minimum) with the District and Forest implementation team to assess implementation progress, effectiveness monitoring and to determine if parameters measured and sampling frequency meet the planned objectives. **The BAER team understands that monitoring funds could be available for effectiveness monitoring in years 2 and 3 provided that the Fishlake National Forest submits interim reports to request addition funding and provided that the Forest documents and shares their findings.**

♦ **Reports**

- A DRAFT INTERIM REPORT will be prepared.

  The overall results will be presented in a detailed report during 2005. This report will be submitted to the Forest Supervisor, other unit District Rangers, the Regional Office and all cooperating agencies and other interested parties.

(Michael D. Smith, Soil Scientist; David Tait, Botanist; Adam Solt and Dale Deiter, Hydrologists)