

Date of Report: ~~July 26~~ October 27, 2004 ~~October 10th, 2003~~
~~Edited J. Bruggink 10/13/03 9:00am~~
~~Edited S. Hazelhurst 10/14/03 11:45am~~

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
- ~~(X)~~ 2. Accomplishment Report
- () 3. No Treatment Recommendation

B. Type of Action

- (X) 1. Initial Request
(Best estimate of funds needed to complete eligible stabilization 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: Cascade II | B. Fire Number: P48247 / UT-UIF-000802 |
| C. State: Utah | D. County: Wasatch ... # 051 |
| E. Region: R4 / Intermountain | F. Forest: Uinta ... # 0418 |
| G. District: D2 ... Pleasant Grove | H. Date Fire Started: 09-23-2003 @ 1705 |
| I. Date Fire Contained: 09-29-2003 @ 1900 | J. Date Fire Controlled: 10-06-2003 @ 1630 |
| K. Suppression Costs: \$ 2,500,000 (estimated final cost) ... taken from the ICS - 209 dated 10-06-2003 | |

L. Fire Suppression Damages Repaired with EFFF – PF12 Funds: (listed for the entire burned-area)

- ♦ Fireline Waterbarred (miles) ~ 3 ¾ miles of hand lines and 7 ½ miles of dozer lines
- ♦ Fireline Re-seeded (miles) ~ 3 ¾ miles of hand lines and 7 ½ miles of dozer lines
- ♦ Other Damages ... (identify) ~ ½ mile of dirt road was widened along lower Decker Creek

(**Note**) – another 2 ½ miles of dozer line was constructed outside the burned-area on private lands

M. Watershed Numbers: 160202030501 ... Provo - Deer Creek
(**6th field HUCs**) 160202030405 ... Deer Creek Reservoir / Provo River

N. NFS Acres Burned: 3,324 **Total Acres Burned:** 7,828

Other Land Ownerships ... list as follows (acres):

(X) Private - 2,780 (X) Wasatch Mountain State Park - 1,485 (X) Deer Creek State Park - 239

O. Vegetation Types:	The majority of the burned-area consisted of mountain shrubs including oakbrush, maple, mountain big sagebrush, birchleaf mountain-mahogany, snowberry, bitterbrush and Wyoming big sagebrush (83 %); some of the lands surrounding the Deer Creek Reservoir had supported perennial and annual grasses along with scattered upland shrubs (7 %); a few mountainsides located on NFS lands had a mixture of aspen with spruce-fir – especially on the north aspects (7 %); the Provo - Deer Creek area had a distinct riparian zone consisting of species adapted to soils having a perched high water table (2 %) and the remaining areas were rock outcrops having < 10 % vegetative cover (1 %). (Uinta National Forest / GIS Database)
P. Dominant Soils:	The benches, foothills and ridgetop areas occurring in close proximity to Deer Creek Reservoir have soils classified as Typic Calcixerolls , Typic Argixerolls and Pachic Argixerolls ; the low elevation mountainsides of Wasatch Mountain State Park have soils identified as being Lithic Argixerolls , Lithic Haploxerolls and Typic Haploxerolls ; the high elevation mountain landscapes occurring on NFS lands have Pachic Cryoborolls , Argic Pachic Cryoborolls while the riparian zones observed along Provo - Deer Creek have both Fluventic Haploxerolls and Cumulic Haploxerolls with small inclusions of wetland areas. (USDA - SCS / Soil Survey Report for the Heber Valley Area, 1976)
Q. Geologic Types:	The burned-area has several types of geologic formations and surficial deposits. Most of the southern ½ of the fire has soils derived from latite parent material; much of the land administered by Wasatch Mountain State Park has soils formed in mixed shales; the vast majority of NFS lands have soils weathered from either

	limestone or sandstone; the Cascade Springs area was actually shaped from glacial deposits, while the Provo – Deer Creek drainage has inherited its land resources from mixed alluvial sediments. (Utah Geological and Mineral Survey, 1980)
--	---

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

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

• **Provo - Deer Creek drainage**

Zero: -0- 1st: 9.1 2nd: 1.8 3rd: 6.2 4th -0- 5th: -0-

• **Deer Creek Reservoir drainage**

Zero: -0- 1st: 8.1 2nd: 1.1 3rd: 0.7 4th -0- 5th: -0-

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

Trails ... ¾ mile (USDA - Forest Service) Roads ... 8.92 miles (USDA - Forest Service)

Trails ... 0 miles (Private Ownership) Roads ... 6.59 miles (Private Ownership)

Trails ... 0 miles (State Parks - 2) Roads ... 7.83 miles (State Parks - 2)

Total Trails ... ¾ mile (Cascade Springs Site) Total Roads ... 23.34 miles

PART 3 ... WATERSHED CONDITION / NFS PROBLEM INVENTORY

A1. Mapping of the Burn Severity Zones: (7,828 total acres occur within the perimeter of the Cascade II - Fire)

1,406 High (18 %) 3,580 Moderate (46 %) 2,842 Low / Unburned (36 %)

A2. Mapping of the Burn Severity Zones: (NFS lands ... 3,324 acres)

308 High (9 %) 1,573 Moderate (47 %) 1,443 Low / Unburned (44 %)

B. Estimation of Water-Repellent soils occurring within the different Burn Severity Zones:

(NFS lands ... 3,324 acres)

216 High (70 %) 786 Moderate (50 %) 72 Low / Unburned (5 %)

Overall Total = 1,074 acres (~ 32 % of the NFS acreage)

C. Rating Soils for Potential Erosion Hazards within the Fire Perimeter: (NFS lands ... 3,324 acres)

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

High

Moderate

Low

632 (19 %)

1,463 (44 %)

1,229 (37 %)

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Indent: Left: 0.25"

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

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

(Numbers below are estimates based upon erosion modeling. Actual amounts can vary significantly from the numbers below. The amounts shown below should only be used to compare the magnitude of change in erosion potential rather than actual predicted amounts)

<u>1st Year</u>	<u>2nd Year</u>	<u>3rd Year</u>	<u>4th Year</u>
28.5 tons/acre/year	13.3 tons/acre/year	7.6 tons/acre/year	4.6 tons/acre/year

Overall Total = 26,898 tons

(additional erosion over a 48 month period)

(Source) – Disturbed WEPP model ... <http://www.forest.moscowfs.l.wsu.edu/fswepp/>

E. Total Sediment Potential: 4,544 tons / mile² ... according to the PSAIC sediment yield model

**PART 4 ... HYDROLOGIC DESIGN FACTORS with
CALCULATED RISK and CLIMATE EVALUATIONS**

The following table is for the Provo - Deer Creek drainage:

- A. Estimated Vegetative Recovery Period: 3 years
- B. Design Chance of Success: 80 percent
- C. Equivalent Design Recurrence Interval: 50 year
- D. Design Storm Duration: N/A *
- E. Design Storm Magnitude: N/A *
- F. Design Flow: 22.4 ft³ / sec / mi²
- G. Estimated Reduction in Infiltration: 7 percent
- H. Adjusted Design Flow: 24.0 ft³ / sec / mi²

(Note *) – the design flow of Provo - Deer Creek at the confluence of the South Fork of Provo – Deer Creek is based upon USGS published equations that estimate the magnitude and frequency of flood-peak discharges based on analysis of gage station data in the region (USGS, 1999)

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

PART 5 ... SUMMARY OF SURVEY & ANALYSIS

Initial Request

Formatted: Left

The Initial BAER report, approved October 17, 2004, contains a complete description of watershed emergencies. Work authorized in the Initial Report has been completed and results are summarized in the transmittal letter for this 2500-8, and in enclosed Table 2.

Formatted: Font: Not Bold

Interim 1 Request~~WYDEN AMENDMENT~~

On the evening of July 16, 2004, much of the Cascade II burn area received heavy rainfall from an intense thunderstorm. No rain gauges were present in the impacted areas, but individuals working at the Cascade Springs Recreation Site just prior to the onset of the rain and hail reported intense rain lasting an estimated 45 minutes to one hour in duration. As a result of this intense rain, a major runoff event and several small mud/debris flow events occurred, and –Runoff from the July 18 storm generated an estimated peak flow of 157 cfs on Provo Deer Creek approximately mid-way between Cascade Springs and Provo Deer Creek/South Fork confluence. Estimated bankfull flow for Provo Deer Creek at the site measured is –50 cfs. The runoff event forced temporary closure of the Canyon Meadows Water System and the CUWCD water treatment plant to switch water sources. Interim #1 Request was submitted on July 26, 2004, and approved on July 29, 2004. Many, but not all of the treatments authorized in Interim #1 have been completed (see Table 2 enclosed with this 2500-8). The remaining uncompleted work authorized in Interim #1 has been suspended due to unusually early and wet winter conditions, and will be completed later this fall or early next spring when weather permits.

Formatted: Font: Bold

Interim 2 Request

Interim #2 request, this 2500-8, requests funds for year 2 monitoring, evaluation and reporting. The monitoring to be conducted was described in the detailed monitoring report prepared in association with the Initial Report. No funding for additional treatments, other than carryover of unused Interim #1 funds, is included in the Interim #2 Request.

“The Wyden Amendment authorizes the Forest Service to enter into cooperative agreements with willing Federal, tribal, State, and local governments, private and nonprofit entities and landowners for the protection, restoration, and enhancement of fish and wildlife habitat and other resources on public or private land, for the reduction of risk for natural disaster where public safety is threatened, or for a combination of both that benefit resources on NFS lands within the watershed.”

The 27.0 square mile Provo Deer Creek drainage contains lands owned by the State of Utah, Uinta National Forest (NF) and other private entities. The State of Utah owns 4.8 square miles, the Uinta NF 18.6 square miles and private entities 3.6 square miles. The headwater area of the watershed is managed primarily by Wasatch State Park. The Uinta National Forest manages the western portion of the watershed, while the eastern and southern portions are privately held.

The Uinta NF is recommending to treat National Forest System Lands with Burned Area Emergency Response (BAER) funds in an attempt to protect water quality, aquatic habitat, recreation facilities, and road infrastructure. BAER Treatments include: straw wattles, aerial seeding and mulching, channel structures, and road reconditioning. Provo Deer Creek provides culinary water to communities in Salt Lake and Utah Counties as well as a rural subdivision within the watershed.

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident,

~~Treatments covered by Forest Service BAER funds cover only National Forest System Lands within the western part of the Provo Deer Creek watershed. The majority of the eastern half of the watershed burned with high or moderate burn intensity and is managed by the Wasatch Mountain State Park and other private land owners. Due to this fact, it is imperative that areas affected by the Cascade II Fire on State and private lands within the Provo Deer Creek watershed be treated.~~

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

~~The Wyden Amendment provides the Forest Service a tool to operate more efficiently across multiple ownerships. The Amendment gives the Forest Service authority to treat upstream State and private lands affected by the Cascade II Fire. Treatment of these lands, in conjunction with the Forest Service BAER Program, will benefit National Forest System lands by reducing impacts to resources such as: soil productivity, water quality, fish and aquatic habitat, recreational facilities and road infrastructure.~~

~~The Wyden Amendment allows the Forest Service to develop collaborative relationships with State and private entities. For the Amendment to work, cost share agreements with the State of Utah and private landowners are desirable. For example, the State may provide a helispot and staging area within Wasatch Mountain State Park for implementation of BAER treatments. This opportunity would reduce the cost of treatment implementation by lowering flight time as well as eliminating the cost of leasing a helispot.~~

~~The Cascade II Fire burned over 7,800 acres on a mosaic of federal, state, and private lands. The Initial BAER Assessment illustrates that critical values at risk exist within and downstream of the burned area. Culinary water supplies for over one million people, important habitat for fish and wildlife, and transportation and recreational facilities all have the potential to be impacted by the Cascade II Fire. The Wyden Amendment helps ensure that risks to the above mentioned resources will be substantially reduced.~~

A. Describe the Watershed Emergency:

~~Please see the Initial and Interim #1 reports-BAER report for a complete description of watershed emergencies. The following section contains monitoring information as well as recommendations for repair and additional emergency treatments.~~

Formatted: Font: Not Bold

~~***No additional BAER treatment needs, beyond those identified in the Initial and Interim #1 Reports, have been identified.***~~

Formatted: Font: Bold, Italic, Font color: Blue

~~On July 19, 2004, Charles Wentlender (South Zone Fire Management Officer) and Ryan Stone (Engineer) visited the burn area to assess impacts. On July 20th, Reese Pope (Forest BAER Coordinator and Ecosystem Group Leader) surveyed the burn area for impacts, and Jeremy Jarnecke (Forest Hydrologist) obtained two tipping rain gauges and installed them at the site. That evening, another thunderstorm event occurred within the burn area. On July 22, 2004, Robert Davidson (Forest Soil Scientist) and Jeremy Jarnecke visited the burn area. The following narrative documents observations and recommendations from these visits:~~

~~**Upper South Fork Deer Creek (NE ¼ of Section 27, T 4. S., R 3 E.)** This stream contains pure-strand Bonneville cutthroat trout. The upper 200-300 yards of this stream reach within the burn area, and the adjacent hillslopes were examined (no BAER treatments were done here). Based on ocular observations of debris, sediment, bent over vegetation, etc. this reach of stream showed evidence of only a very minor increase in flows (about 1" in stream depth). No evidence of accelerated sediment or ash delivery to or transport by the stream, or potential impacts to fisheries habitat was observed. A walk thru of the adjacent burned upland areas found no evidence of rilling, or sheet erosion, and good ground cover. Similarly, no evidence of elevated flows or sedimentation were documented at its' confluence with Provo Deer Creek. Turbidity measurements on 7/22/04 yielded 1.3 NTU on the~~

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

South Fork, compared to 6.3 on Provo Deer Creek. ***No needs for additional BAER treatments in this area were identified for this time.***

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Lower Bear Canyon (along FR #196 above FR #114, NE ¼ of NW ¼ and NW ¼ of NE ¼, Section 24, T 4 S., R 3 E.)—Bear Canyon exhibited evidence of substantial runoff from the storm. The culvert under FR #114 appeared to have run at about 50–66% of capacity, the intermittent channel appeared to have had flows approximately 5 feet in width and 1' in depth. The 3-v mesh channel structures above the road had backed up considerable water (one had a ponded area estimated to be about 18' long, 6' wide, and 2' deep), and trapped some sediment, ash and organic debris. ***These should be cleaned out.*** The center most straw bales on these had failed or partially eroded. ***The bales should be replaced on the lower 2 structures, and removed on the upper (use the upper as just a debris fence).*** The structures were intact, though the fence had stretched some. Minimal channel damage was evident (still largely grassed over, no rills, etc.). One ephemeral channel (drains roughly 150 acres) near the end of the Bear Canyon Road (FR #196) appeared to have had flows about 3' wide and 0.75' deep, but no rilling, scouring, or erosion was evident. This catchment drains severe burn/treatment polygons #3A and #3B, and contributed the majority of the sediment and organic material deposited in the channel structures. ***Recommend placement of 2–3 straw bale checkdams in this drainage to deter future sediment transport.*** A short walk thru in treatment unit #3B (seeded and mulched) found no evidence of rilling, and little if any evidence of sheet erosion. Ground cover was good. The Bear Canyon road (a native surface road) showed evidence of substantial runoff, and minor sheet erosion from the road prism. Some water bars were largely filled with sediment and need to be cleaned out. ***Where these occur, an additional waterbar should be interspersed upslope to minimize future maintenance needs.*** No water bars failed, none were overtopped, and little evidence of rilling was observed on the road surface. In short, all treatments appeared to be successful in accomplishing their purpose.

Lower Bear Canyon (200–300 yards below FR #114, SW ¼ of NE ¼, Section 24, T 4 S., R 3 E.)

—Four v mesh structures were inspected here. Their condition was similar to those above the road (see preceding paragraph). ***These should be cleaned out, and the straw bales replaced similar to those above FR #114.*** A short walk thru along the western edge of treatment unit #3B (seeded and mulched) found no evidence of rilling, and little if any evidence of sheet erosion. Ground cover was good.

Bear Canyon Spring area (just below FR #114, NW ¼ of NE ¼, Section 24, T 4 S., R 3 E.)—No evidence of impacts to the spring were observed. No rill or sheet erosion, or sedimentation was evident. Ground cover was good. ***No needs for additional BAER treatments around the springs were identified for this time.***

Cascade Springs (E. ½ of NE ¼, Section 24, T 4 S., R 3 E.)—At Cascade Springs there is evidence of sediment and/or straw deposition behind a few of the surrounding straw wattles, but no evidence of sediment deposition into any of the springs/pools. The intermittent channel running into the upper springs/pool showed evidence of runoff, but there is no evidence this runoff had deposited sediment, ash, or debris into the upper springs. The v mesh fences on this channel had trapped some straw and a very minor amount of sediment and appeared to have functioned as designed. One other area of runoff (a small swale) was found. This originated in treatment area #4A and ran into the west side of the upper pool. No sediment deposition was found in either the pool, or trapped on the walkway or in vegetation. A short walk thru in treatment unit #3B (seeded and mulched) found no evidence of rilling, and little if any evidence of sheet erosion. Ground cover was good. ***No needs for additional BAER treatments around Cascade Springs were identified for this time.***

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Cascade Springs Recreation Site (E. ½ of NE ¼, Section 24, T 4 S., R 3 E.)—Mud flows from the drainage just east of the lower parking lot area, deposited a considerable volume of mud and debris in the parking lot, across FR #114, on the floor of the kiosk and one of the restrooms, on walkways accessing the springs, and in the surrounding vegetation. A small amount of this also reached Little Provo Deer Creek and impacted water quality there. District crews have been working to clean up the mud so the area can again be used by Forest visitors. District employees report that similar mudflow events have periodically occurred in the past (pre-burn). Examination of the flows indicates the vast majority of the mud and debris came from sheet and rill erosion on the Cascade Springs-Midway road (a native surface, Wasatch County Road, this segment of which is almost entirely located within Wasatch State Park).

Little Provo Deer Creek just above Cascade Springs appears to have carried very large flows. The flow path during the storm appears to be roughly 14-16' wide and 4.5-6' deep. On July 19th and 20th, the stream here was moderately muddy and turbid. Most of this turbidity is originating from sediment deposited in the channel from the road in lower Thomas Canyon.

Cascade Springs-Midway Road (NW ¼ Section 19, T4S., R4E.)—Flows captured by the Cascade Springs—Midway Road were likely augmented by runoff caused by the still hydrophobic soils found in portion of this drainage. Flows on the road were further augmented by runoff from a fall-line OHV trail and north ridgeline road, at the saddle approximately 0.75 miles east of Cascade Springs (as evidenced by significant erosion on these roads and trails and their outlet into the very head of this drainage and eroded roadway). The Cascade Springs-Midway Road is located near, and in some reaches in the bottom of this relatively steep drainage. Waterbars were recently constructed on this reach of road using BAER (Wyden Authority) funds. These waterbars had limited success. Although all worked to divert flows, some were overtopped and others were largely filled with sediment. **The waterbars on the Cascade Springs—Midway road need to be repaired and deepened, and where feasible, additional waterbars interspersed.** On some segments, the road location precludes installation of additional water bars. **Waterbars should be installed on the north ridgeline road from the saddle to the first switchback to reduce runoff contributed to the Cascade Springs—Midway road. Access to the fall-line OHV trail should be blocked by installing a post and cable fence system on the upper end of the trail where it joins the north ridgeline road.** A very short walk thru in the upper reaches of treatment units #5A and 5B (seeded and mulched) found no evidence of rilling, and little evidence of sheet erosion. Ground cover and vegetation establishment was good.

Lower Little Provo Deer Creek (SE ¼ of SE ¼ of Section 24, and E. ½ of NE ¼ of Section 25, T 4 S., R 3 E.)—Mud flows occurred from the 2 west facing drainages located just south of Cascade Springs (Tributaries #1 and #2 respectively [see map in BAER Report]). Smaller debris flows occurred on all ephemeral drainages within these two drainages and from the next 2 ephemeral drainages to the south. The drainage paths for most of these ephemeral drainages appear to be largely intact, only exhibiting some evidence of erosion where they crossed road cuts and/or in their very lower most reaches. Tributary #1 appears to have carried flows roughly 8' wide and 2.5' deep. Tributary #2 appears to have carried flows roughly 10' wide and 1.5' deep.

FR #114 (unimproved, native surface) follows near the toe of the slope along Little Provo Deer Creek. Waterbars were recently constructed on this reach of road using BAER (Wyden Authority) funds. These waterbars had fair success. Although all worked to divert flows, some were largely filled with sediment, and in some cases sheet and rill erosion on the road prism were evident

between the waterbars. ~~These waterbars need to be repaired and deepened, and where rills were eroded, additional waterbars interspersed.~~ As part of the recent BAER funded work, enlarged culverts were installed where this road crosses tributaries 1 and 2. Flows from the recent storm event overtopped the road at both of these culvert crossings. For tributary 1, the culvert (sized for the estimated post fire 100-year storm event of 25 cfs) was apparently inadequate to handle the flows it received. BAER treatments in tributary 1 included a v-mesh fence constructed just upstream of the culvert. This fence failed during the storm. The fence trapped some debris and sediment, but the center of the fence was laid over by flows. This fence is located in a steep reach of stream. ~~This fence should be replaced with 2 fences: (1) the upstream fence constructed of hog-wire or similar and (2) the lower fence a v-mesh fence. Both should be constructed without straw bales (just posts and v-mesh wire) to catch rocks and brush while allowing more permeability and thru-flow and thus reduce the likelihood of failure.~~ Their intended purpose is to catch debris that might otherwise partially or totally plug the culvert below. For Tributary #2, the culvert (sized for the estimated post-fire 100-year storm event of 35 cfs) was partially blocked by debris, and this may have contributed to it being overtopped. This blockage was removed by Forest crews on July 20th (funded with non-BAER funds). Both culverts are still intact and functional. Riprap placed at the outlets of the culverts was washed away and a plunge pools resulted from the flows. ~~Both need some minor repair work on the outlet where outflows partially washed the riprap placed there away. The riprap should be replaced with 12-24" diameter riprap. This material can be found onsite.~~ Overflow from these washed down the road, eroding some of the road surface and contributing to problems with the waterbars as discussed above. The roadway is still functional.

A substantial sediment bar can be found on the terraces along Little Provo Deer Creek and below Tributaries #1 and #2. For the most part, sediment from these channels appears to have been trapped by vegetation and straw wattles placed here. ~~About three to five segments of the straw wattles were overtopped, and/or breached (i.e. undercut) and need to be replaced. A similar amount should be repaired and cleaned.~~ Most of the straw wattles in this area are still in serviceable condition and trapped minor amounts of sediment and debris. A small amount of sediment from Tributary #1 appears to have reached Little Provo Deer Creek. On July 19th and 20th, the stream here was cloudy and turbid, but not extremely so. Most of this turbidity is originating from sediment deposited in the channel from the road in lower Thomas Canyon. Runoff from the July 18 storm generated an estimated peak flow of 157 cfs on Provo Deer Creek approximately approximately mid-way between Cascade Springs and Provo Deer Creek/South Fork confluence. Estimated bankfull flow for Provo Deer Creek at the site measured is ~50 cfs. Debris indicates the stream rose about 16-20" from the storm. Beaver dams along this reach are mostly intact, though some appear to have received some damage (i.e. some logs apparently originally part of the dams are lodged in streamside vegetation downstream of the dams). Only minor sediment bars were evident in most of these beaver ponds (i.e. much of the sediment appears to have flushed further downstream).

The main storm event appeared to have missed the lower reaches of the burn. Drainage paths in this area exhibit evidence of rain, but do not show evidence of major flow events.

Upper Little Provo Deer Creek and Lower Thomas Canyon (W. ½ of Section 18, T 4 S., R 4 E.)
—The Cascade Springs Deer Creek Campground road located in Wasatch State Park experienced severe erosion during the storm event. Thomas Canyon drains across this road about 0.2 miles upstream of FR #114 and the Cascade Springs Recreation Site. This canyon experienced large runoffs from the storm, and most of this runoff was intercepted by the Deer Creek Campground Road, a native surface road. At this point the water ran down the road and eventually across FR #114 and into Little Provo Deer Creek (just upstream of the Cascade Springs Recreation Site). This

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

~~runoff caused substantial sheet and rill erosion from the road surface. This sediment, which was deposited into Little Provo Deer Creek, is responsible for most of the impacts to water quality in Little Provo Deer Creek. A cursory examination of the Thomas Canyon road crossing failed to find any culvert; however, it is possible one is present but buried. District personnel failed to find any evidence of a culvert while using a metal detector. To prevent future major water quality problems, this crossing should be improved. An armored low water style crossing may be the most appropriate. The road surface has had most of its fines eroded away. This has left an extremely rough but passable roadway. The road is used as an OHV route. To keep additional sediment from being washed into Little Provo Deer Creek, sediment filling the cut ditch was removed for a short stretch immediately above this road's junction with FR #114 (funded with non-BAER funds). Cross drainage from this ditch should be constructed, or the ditch filled and the road outsloped. A culvert near the intersection with FR #114 was exposed by the erosion. The existence of this culvert was not previously known. It is likely the culvert has not functioned properly for some time prior to the fire. The culvert should be cleared and opened and recovered with about 12" of material.~~

~~The 3 foot culvert on the ridgeline access road crossing of Provo Deer Creek (~2.4 miles north of paved Cascade Springs Road) had evidence of water backed nearly to the road surface. The watershed above this crossing was not burned. This indicates that, even without fire related increased runoff, the watershed responded with elevated flows.~~

~~Upper Tributary #1 (SE ¼ of the NW ¼ of Section 19, T 4 S., R 4 E.)—The upper reaches of this drainage were examined by a short walk thru. No rilling and little if any evidence of sheet erosion was observed. BAER funds were recently used (pre-storm) to obliterate an unauthorized road/trail in this drainage. In the sections examined, no rilling or erosion was observed. The road surface was recontoured and left full of poek marks to discourage such and this appeared to be highly successful. Vehicle tire tracks were observed on about the first 100 yards of the closed roadway. No needs for additional BAER treatments were identified for this area.~~

~~◆ THREATS TO WATER QUALITY ... the Cascade II Fire affected watersheds that supply irrigation and culinary water to Utah and Salt Lake Counties. These counties are home to over 1 million people combined. Two major watersheds were affected by the recent fire incident. Streams on the western half of the fire drain to Provo Deer Creek while streams on the eastern half drain to Deer Creek Reservoir. Drinking water is supplied to Provo, Orem and Salt Lake City as well as a small subdivision (Canyon Meadows) whose source of drinking water is from Provo Deer Creek just below the Forest boundary. The Provo River main stem and Deer Creek Reservoir are major suppliers of culinary water for the Salt Lake/Utah County area.~~

~~The main threat to water quality is the delivery of ashy sediment and nutrients into drinking water sources, mainly Provo Deer Creek, Provo River, and Deer Creek Reservoir and the threat of sediment and nutrients flowing into Cascade Springs. Effects to water from increased runoff and erosion are most likely to occur in the next 2—3 years during spring runoff and/or summer/early fall thunderstorms in fire affected areas without ground cover. Prior to the Cascade II incident, streams and rivers in the area were buffered with healthy riparian stands and the upland areas had thick dense stands of mountain brush. The fire burned large areas of upland vegetation and several areas in riparian communities that normally buffer sediment and nutrient transport and protect water quality. Also, there are steep hillsides immediately adjacent to the riparian areas that were burned mainly along the perennial Provo Deer Creek and along many ephemeral streams. Deer Creek Reservoir is currently listed on the State of Utah /2002—303(d) List for temperature and dissolved oxygen. Additional sediment or nutrients transported to the Deer Creek Reservoir may further impact water quality. The fire burned the mountain brush that surrounds Cascade Springs leaving the spring at risk for increased sediment and nutrient loading.~~

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Bullets and Numbering

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

◆ ~~LOSS OF LONG-TERM SOIL PRODUCTIVITY~~ ... most of the soils occurring within the HIGH severity burn zones of the Cascade II Fire exhibit a moderate to high degree of hydrophobicity (water repellency) at sampling depths of 1/2 to 3 inches below the ground surface. Hydrophobic soils are common after wildland fire and are a temporary condition that may persist for a period up to 3 years. Hydrophobic soil conditions greatly modify the burned area hydrologic function by restricting, and in some cases preventing, water infiltration into soils, thus increasing water runoff and the potential for increased soil erosion.

Prior to the burn, the maximum threshold for soil loss tolerance was estimated to be at 4.6 tons/acre/year (Disturbed WEPP Soil Erosion Model) within the Cascade Springs area. Immediately after the burn, initial soil loss has the potential for accelerated rates of erosion of up to 28.5 tons/acre/year and, at the end of Year Two is estimated at 13.3 tons/acre/year. Although these are estimates with ± 50% or more reliability the estimates indicate a potential increase of erosion amounts of a magnitude of 5-7 in the burn area.

Soil associations found in very steep terrain and classified as loamy soil textures, occur in the HIGH burn severity areas within the Cascade II Fire perimeter on Forest Service, Wasatch Mountain State Park, and private lands. These soil associations are characterized as having rapid runoff with high erosion hazard. Each of the HIGH burn severity zones are either upslope from, adjacent to, or drain immediately into Provo Deer Creek, which is the primary culinary water source for the Canyon Meadows housing community.

A MODERATE burn severity zone which is immediately adjacent to Provo Deer Creek, south of Cascade Springs, contains a thin 6 inch topsoil horizon. Future soil productivity will be negatively impacted by any loss of these slightly hydrophobic, thin top soils. In addition, due to the large drainage area and the long continuous slopes associated with these denuded east facing hillsides, an imminent threat to sediment delivery is posed for Provo Deer Creek.

Wasatch County's main transportation route into Cascade Springs is located within Wasatch Mountain State Park. This road is threatened by very steep (40% to 60% slopes), north facing HIGH burn severity slopes and south facing MODERATE burn severity slopes, both with loamy soils. This primary transportation corridor is threatened by debris flows in a major rainfall event. Additionally, it should be noted that the ephemeral, riparian corridor that once existed in this steep, short canyon is occupied by the road surface, diverting drainage directly into the Cascade Springs area and away from the natural channel located at the lower end of the canyon.

◆ ~~TRANSPORTATION SURFACES~~ ...

Cascade Springs Road, FSR 114 ... road is two-laned and paved, connecting the Alpine Loop, SR 92, to the Cascade Springs Interpretive Site. The road may not be closed until the normal winter closure. Many culverts are 15" in diameter and most are only partially open or are entirely inoperable. Under these conditions, the culverts may not be able to sufficiently handle increased water flows and may overtop the road, leading to dangerous driving conditions or road closures. Increased pore pressures in the road prism may cause damage to the road. The road passes directly through the burned area and is mostly bordered by low and moderate intensity burns. Several culverts have been identified that allow

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

~~the road to cross specific drainages impacted by high intensity burns that run a risk of increased water flows.~~

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

~~**Little Deer Creek Road, FSR 475** ... road is accessible to four wheel drive vehicles. It continues south from the Cascade Springs Road and provides an outlet to Provo Canyon. Road may be subject to RS2477 claims, and may not be closed until normal winter closure. The road contains native surface with three culverts that are damaged or silted in. Under these conditions, the culverts may not be able to sufficiently handle increased water flows and may overtop the road, leading to dangerous driving conditions or road closures. Because of the nature of the native surface, the road is susceptible to erosion, rutting, and other water damage. The road is located near the Provo Deer Creek stream channel. Without proper drainage structures, sediment from the road will enter the waterway.~~

~~**Bear Canyon Road, FSR 196** ... road is a native surface road within the fire boundary. It passes through areas of high and moderate intensity burns. The road provides access to the Bear Canyon Spring that services the Cascade spring water system. The water system needs to be monitored to verify that there are no adverse effects due to the fire. There are no drainage structures on the road. The road is narrow and has worn deep into the ground with the road surface being 1.5 feet below the surrounding ground. Because of the nature of the native surface, the road is susceptible to erosion, rutting, and other water damage. There is a waterline buried under a portion of the road. Erosion of the road could lead to unearthing the water line.~~

~~**The road that continues east from Cascade Springs into Wasatch Mountain State Park** ... is steep, with grades greater than 10%. It is located in the bottom of the drainage. Both faces on either side of the road are burned with high and moderate intensity burns with steep slopes. In a major event, the water will be channeled down the road and threaten the Cascade Springs facility. The road is a native surface and highly susceptible to erosion due to the steep grades.~~

~~**Host site with a Septic Tank and Drainfield** ... in a major event the ground could become saturated and the effectiveness of the waste water treatment could be compromised. Waste water must not be allowed to surface, or enter the ground water. Additionally, there is the potential of damage due to soil erosion or movement. Should the ground become saturated, the septic tank will be lifted out of the ground due to buoyancy.~~

~~**Another drainfield** ... that supports the comfort station at the Cascade Springs facility is located west of the road that continues next to Deer Creek. Above the road is a drainage that passes through a culvert to the area where the drainfield is located. Again, in a major event the ground could become saturated and the effectiveness of the waste water treatment system could be compromised. Waste water must not be allowed to surface, or enter the ground water. Additionally, there is the potential of damage due to soil erosion or movement.~~

~~There are several locations in the burned area where the lack of vegetation could encourage illegal off-road use. This could cause severe resource damage and accelerate erosion.~~

Off-Forest Locations ...

~~**Decker Canyon** ... is fed by tributaries that have high intensity burns. The roads will experience high flows through the culverts. These roads are also native surface. Because of the nature of the native surface, road is susceptible to erosion, rutting, and other water damage. These roads will be needed for other resource protection activities, including access to power lines and railroad.~~

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

~~The Heber Valley Railroad ... is a privately operated railroad and represents an economic interest. The railroad is eligible for the National Register of Historic Places. The railroad crosses the major drainages, Decker Canyon and Provo Deer Creek, and other 1st and 2nd order drainages. The major culverts have large amounts of debris at the inlet, are silted in, or have vegetation clogging the channel. The culverts and railway could be compromised by a major event. The railway was closed during the fire, but has since reopened.~~

~~Canyon Meadows ... a small community, takes its water directly out of Provo Deer Creek, approximately 30 feet downstream from the Forest Boundary, on private property. The collection device consists of a 12" diameter pipe, with a 1/2" screen secured to its end laid directly in the stream. The system provides culinary and irrigation water for a community of about 42 homes. Treatment includes coagulation, flocculation, filtration and disinfection, as required for treatment of surface water by the State of Utah Drinking Water Rules. The system stores treated water in a tank that has an effective volume of 130,000 gallons. The system is operated daily during the irrigation season and twice a week during the winter on an as needed basis. The system is equipped with online turbidity monitoring, but there is no warning system provided for influent water.~~

~~◆ FS / CASCADE SPRINGS RECREATION SITE ...~~

Formatted: Bullets and Numbering

~~The Cascade Springs area containing the interpretive materials and facilities sustained low to intense burning. The area that sustained the most heat is in the upper springs area on the west and south west side. Most of the riparian area appears to be unaffected. A dry stream bed, diversion ditch, and steep hillside pose erosion problems, if left unprotected, in the event of a heavy rain or spring runoff which would cause ash and silt to contaminate the springs.~~

~~The Cascade Springs VIS 8323 site north of the main spring area was developed for drinking water in 1985. It has been intermittent since 1985, but has produced water in high water years such as 1996. It is connected to the Bear Canyon system currently providing potable water to Cascade Springs VIS, and will be used as supplemental water in the event it starts flowing again. The post and rail fence that burned defined the dry spring area. A cement ditch around the west side of the spring diverts runoff water from the asphalt Cascade Springs road 114 away from the spring to prevent contamination. The State Division of Drinking Water requires a minimum cover of topsoil over a spring site. Erosion of the topsoil would compromise the viable integrity of the spring source and contaminate the water supply.~~

~~◆ NOXIOUS WEEDS and INVASIVE PLANT SPECIES ... due to both the fire itself and the suppression activities are of immediate concern to the Uinta NF / BAER Team. Populations of Canada thistle, Musk thistle, Scotch thistle, Leafy spurge, Dalmation toadflax, Cheatgrass and Field bindweed were present within the fire area prior to the ignition. The loss of vegetation cover and soil disturbance caused by the fire has opened up an "invasion window" for colonization by noxious weed species in previously uninfected areas.~~

Formatted: Bullets and Numbering

~~Canada thistle (*Cirsium arvense*) Is a colony forming perennial from deep horizontal roots. Is highly aggressive and difficult to control.~~

~~Musk thistle (*Carduus nutans*) Invades disturbed areas spreading rapidly and forming dense stands which crowd out desirable species.~~

~~Scotch thistle (*Onopordum acanthium*) Large colonizer in disturbed areas. Can form dense stands that are impregnable to large mammals.~~

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

~~**Leafy spurge** (*Euphorbia esula*) – Colonizer that has an extensive root system that can sucker. Forms dense colonies that out compete native vegetation~~

~~**Dalmation toadflax** (*Linaria genistifolia*) – Is a deep rooted invader that crowds out native vegetation.~~

~~**Cheatgrass** (*Bromus tectorum*) – Winter annual that can vigorously compete with natives for early spring and early summer moisture. Cheatgrass cures early in the summer providing flashy fuels early in the fire season.~~

~~**Field bindweed** (*Convolvulus arvensis*) – Extensive and deep root systems – which give rise to lateral roots that can sucker.~~

◆ ~~ADDITIONAL CONCERNS BY THE RESOURCE SPECIALISTS~~

~~**Protection of Bonneville Cutthroat Trout Conservation Habitat** ... The South Fork Deer Creek contains a genetically pure population of Bonneville cutthroat trout, listed as a Sensitive Species by the Forest Service and, a conservation species by the State of Utah, and has been certified to be whirling disease free. Of particular concern is the area between 0.4 and 1 mile from the confluence with Provo Deer Creek, where the area adjacent to the riparian area burned with moderate intensity. This area has the potential to have a minimal increase in ash and sediment yields resulting strictly from the fire. These potential increases in ash and sediment yields are not expected to damage existing cutthroat habitat within and below the fire perimeter.~~

~~**Invasive Species Control on Critical Wintering Habitat** The Utah Department of Wildlife Resources (UDWR) has identified 2699 acres of critical elk wintering habitat and 1080 acres of critical deer habitat that has burned, all on private and State lands. Invasive grasses such as cheat grass (*Bromus tectorum*) existed in the area prior to the Cascade II Fire. This species recovers rapidly following a fire, thereby suppressing native plant growth.~~

~~**Protection of the Provo River / Class I Fishery from Sedimentation and Nutrient Deposition through the Provo Deer Creek Tributary** ... The Provo Deer Creek is a tributary to the Provo River, a class 1 fishery. The current situation will allow ash, nutrients and sedimentation to occur within the Provo Deer Creek, which will in turn flow down into the Provo River, a popular fishing destination. Areas of concern extend from directly below the Cascades Springs area until the edge of the burn. The drainage to the northwest of the springs has the potential for sheet erosion to occur and deposit sediments, ash and nutrients into the Provo Deer Creek directly below the springs. The hills and ranges southwest of the springs also have the potential for sheet erosion to occur and deposit sediments, ash and nutrients into the creek. The length of the Provo Deer Creek from the springs south to the edge of the burn currently will allow sedimentation, ash and nutrients to enter the stream.~~

B. B. Emergency Treatment Objectives:

Please see the Initial BAER Report for overall treatment objectives.

~~The objectives of the proposed Interim treatments are to repair or replace initial treatments that have failed been damaged or have reached capacity for controlling runoff. Any new treatments are to meet the The primary objectives of the Cascade II Burned Area Emergency Response program as described in the Initial BAER report. Treatments being requested include treatments on state lands under Wyden Authority. A current agreement (Initial BAER) will be modified to allow treatments to be installed on the non-FS lands.~~

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Font: Not Bold

Formatted: Indent: Left: 0.5"

Formatted: Font: Not Bold

Formatted: Font: Not Bold

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

~~are 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 by the Uinta NF / BAER Team are specifically designed to achieve the following results:~~

- ~~•Maintain Regional and Forest Plan standards for long-term soil productivity and promote the recovery of hydrophobic soil conditions through vegetative re-establishment of severely burned areas.~~
- ~~•Conduct monitoring for early detection and eradication of noxious weed species to ensure the burned area can recover to a properly functioning condition.~~
- ~~•Establish vegetative cover, trap upland sediment and nutrients, and install structures that will capture mobilized sediment and nutrients to protect downstream culinary water quality, aquatic resources, and fish habitat.~~
- ~~•Protect Provo Deer Creek from increased sediment delivery and possible debris flows as a result of increased burn area runoff. This recommendation falls under the Wyden amendment and includes treatment of HIGH burn severity slopes on Forest Service, State, and private lands inside the Provo Deer Creek watershed.~~
- ~~•Use seeding, straw mulching, and straw wattles within the Cascade Springs watershed to protect main transportation routes, parking lots, and structures from increases in runoff and sediment transport. Seeding and straw mulching is recommended around the entire upper spring and upper parking lot areas to stabilize erosive soil and ash, especially on steep slopes. Straw wattles will be used along the upper path area and hillside to catch erosive material. The existing diversion ditch bank has eroded in a 10 ft. wide area which has allowed runoff to create another gully that descends directly onto the asphalt path. Straw wattles and restructure of the ditch bank are needed in the gully.~~
- ~~•Clean out the cement ditch so it flows properly to carry any ash and erosion away from the spring. Reseed spring area to prevent erosion of topsoil.~~
- ~~•Ensure that increased flows will be able to move through the drainage structures on the Cascade Springs Road and not impact the road prism integrity. Armor inlets and outlets of culverts in critical drainages, specifically Bear Canyon and Provo Deer Creek.~~
- ~~•Prevent the Little Deer Creek Road from rerouting and concentrating overland runoff that can produce and deliver sediment to the channel network via the road prism. Keep erosion from unearthing the sewer line buried at the bottom of the cutslope along the road, as well as prevent the road from washing out or becoming impassable to protect possible RS2477 rights.~~
- ~~•Prevent the Bear Canyon Road and from rerouting and concentrating overland runoff that can produce and deliver sediment to the channel network via the road prism. Keep erosion from unearthing the water line buried beneath the Bear Canyon Road.~~
- ~~•Prevent “The Cove” Road from rerouting and concentrating overland runoff that can produce and deliver sediment to the channel network via the road prism.~~

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

- ~~Prevent large amounts of water accumulation from being concentrated and rerouted on the road east of Cascade Springs within Wasatch Mountain State Park. Reroute the flows to the natural drainage and ensure the culvert will support the increased flows.~~
- ~~Prevent any septic tanks and drainfields within the burned area from becoming saturated by slowing flows that will encourage infiltration upslope and divert flows around the facility.~~
- ~~Discourage illegal off road use in all recovering areas.~~

~~Off-Forest Locations...~~

- ~~Prevent the Little Deer Creek Road from concentrating and rerouting overland runoff that can generate and deliver sediment to the channel network via the road prism. In addition, prevent road from washing out or becoming impassable~~
- ~~Ensure that increased flows will be able to move through the drainage structures on the Heber Valley Railroad and not affect the integrity of the railroad prism.~~

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

Please see the Initial and Interim #1 Reports.

~~Land ... 80 %~~

~~Channel ... 75 %~~

~~Roads ... 80 %~~

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0.5"

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

D. Probability of Accomplishing Treatment Success:

Please see the Initial and Interim #1 Reports.

	Years after Treatment		
	1	3	5
◆ Land	70 %	80 %	90 %
◆ Channel	80 %	75 %	70 %
◆ Roads & Trails	90 %	85 %	80 %

E. Cost of Taking No-Action: (including potential loss)

Please see the Initial and Interim #1 Reports.

ome of the impacts directly related to taking no action on this fire incident would include contaminating the culinary water supply of the residents living in the affluent community of Canyon Meadows (~\$ 21,000,000 worth of property); secondly, if ash, sediment and debris becomes transported into Deer Creek Reservoir and the Provo River ... it will adversely affect the recreation activities and drinking water supply for the residents of Utah and Salt Lake Counties (~1,000,000 people). This situation actually occurred during CY 2000 when a small episode of flooding from the East Vivian Fire contaminated the drinking water supply in Provo River for a period of about 1 week. This caused Provo City and the Central Utah Water Conservancy District to acquire its water elsewhere in order to match the demands of its customers. Their back up in this situation was to draw water from Deer Creek Reservoir. In this particular instance, if sedimentation runs off the burned areas, both the Provo River and the Deer Creek Reservoir will be affected leaving no back up water supply. This could eventually impact 3 treatment facilities within Salt Lake County and 1 treatment facility in Utah County. The USDA – NRCS has described the current situation as being **Urgent and Compelling** in its request for EWP funds. Other important values include the transportation surfaces located within the perimeter of the burned area, potential impacts to the FS / Cascade Springs Recreation Site and affects to the State of Utah and private lands.

Dave Pieher, Chief Engineer with the Central Utah Water Conservancy District evaluated the impacts as follows:

“The cost the agencies would potentially incur would be the cost to replace the water from other sources, but during certain times of the year the Provo River water is the primary source and could not be replaced by other sources. The cost of replacement water varies between \$50.00 and \$300.00 per acre foot, averaging \$150.00 per acre foot. The quantities of water for culinary use average 206 acre feet per day during October 15 to April 30 (\$30,900/day); 830 acre feet per day from May 1 to August 31 (\$124,500/day); and 326 acre feet per day from September 1 to October 15 (\$48,900/day). From the estimated costs it is clear that multiple rain storm events and flash floods or snow melt runoff could increase the estimated impacts to exceed \$1,000,000.00 per year. The estimated impacts are only for drinking water uses and do not include other impacts such as the aquatic fishery uses, especially the endangered species, June Sucker, native only to the Provo River.”

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Indent: Left: 0.5"

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0.25"

Formatted: Indent: Left: 0.25"

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident,

F. Cost of the Recommended BAER Treatments on NFS Lands: (including loss)

Approximately \$ 1,250,000 ... since the treatments are expected to be about 70 to 90 % effective during the 1st year after the burn.

Please see the Initial and Interim #1 Reports.

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

(X) Soils (2)	(X) Geology	(X) State Parks (2)	(X) TES --- Plants
(X) Hydrology (2)	(---) Contracting	(X) TES --- Wildlife	(X) Fire Dispatch
(---) Ecology	(X) Helicopter Crew	(---) Research	(X) Archeology
(X) GIS Staff (2)	(---) Range	(X) District Staff (2)	(X) Engineering
(X) TES --- Fisheries	(X) USDA – NRCS	(X) Utah – DWR	(X) Lands Specialist
(X) Botany (2)	(X) USDI – BOR	(X) Public Affairs	(X) BAER Assistant

Please see the Initial and Interim #1 Reports.

Co-Team Leaders: Reese Pope (Ecosystem Group Leader and Forest BAER Coordinator / Uinta National Forest)

Michael D. SmithRobert Davidson (Soil Scientist / UintaFishlake National Forest)

Phone: (801) - 342 – 5104 (Reese Pope)

(435 801) – 896 342 – 52339233 / ext. # 1071 (
Robert DavidsonMike Smith)

E-Mail: rpope@fs.fed.us

mdsmith01@fs.fed.us

H. Treatment Narrative - NFS Lands with BAER Funds:

(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)

These are describe under Part A above.

~~♦ Treatments would be implemented as soon as possible, upon approval of the funding. Work on Wasatch State Park would be maintenance to, and in two cases, an expansion of the previously approved work there, and would only be implemented after the appropriate agreements have been updated and approved. Land Treatments ... conduct aerial seeding on 923 acres of high elevation landscapes using a Type III helicopter East of Provo – Deer Creek (\$87, 685); use a fixed wing aircraft to seed another 144 acres on a landslide bench located south of the Cascade Springs area along the Provo – Deer Creek (\$9, 168); hand seed about 11 acres of fragile riparian zones located in several places along the Provo – Deer Creek drainage (\$2,838); aerial mulch 490 acres of severely burned terrain using a Type III~~

Interim Initial BAER Report9/17/201311/29/200410/28/200410/27/200410/16/200310/13/2003
Cascade II Fire Incident

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Indent: Left: 0.5"

Formatted: Indent: Left: 0.5"

Formatted Table

Formatted: Heading 4

Formatted: Default Paragraph Font, Font: Times New Roman

Formatted: Font: Bold

Formatted: Font: Not Italic

Formatted: Font: Not Bold, No underline

Formatted: Bullets and Numbering

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

helicopter—the application rate will be 1 ton / acre (\$449, 330); hand mulch another 11 acres in the vicinity of Cascade Springs using a Type II / Fire Crew (\$7, 117);

◆ place 10,000 linear feet of straw wattles in fire damaged areas along the Provo—Deer Creek drainage south of Cascade Springs (\$21, 000); place 5,000 linear feet of straw wattles using a Type III helicopter West of Provo—Deer Creek transport (\$23, 000); at the Cascade Springs Interpretive site: clean the diversion ditch (\$200), place another 5,000 linear feet of straw wattles directly adjacent to the springs (\$10, 500), install 60 feet of V Mesh fence in a channel to trap debris (\$900), hand seed and mulch another 39 acres located near the springs (\$35, 295). (Total ... \$636, 533)

Project inspectors will evaluate land treatments during implementation to assure contract specifications are being met. Some of the critical contract implementation questions for the contracting officer's representative (COR) include the following (Total \$7,000):

Seeding

- Was the seed purchased certified to be free of noxious weed species?
- Was the seed tested for its germination rate?
- Were the Helitack and ground crew of sufficient number to support the operation?
- Was the proper Helispot selected for the mission with respect to safety and turn-around time between flights?
- Was the seed protected from moisture prior to its application on the ground?
- What was the soil moisture content at the time of the seeding?
- What were the weather conditions at the time of seeding—especially wind speed and wind direction?
- How did the pilot keep track of his flight lines ... on board GPS unit, orange flagging dropped from the seeding bucket or support crew working on the ground?
- Was the seed pre coated with a micronutrient powder to enhance its germination rate?

Mulching

- Was the straw product certified to be free of noxious weeds?
- What was the moisture content of the straw at the time of application: was it considered ideal for spreading the mulch?
- Was the straw delivered to the staging area / helispot when it was needed for the treatment?

Straw Wattles

- Were the correct number of straw wattles applied to the landscape?
- Were the wattles staked down into the ground every 4 feet using 24 " wood stakes?
- Were the wattles placed flush against the ground surface?
- Was the site preped before the treatment was implemented?
- How many wattles could the Helitack Crew safely sling at one time using an 18 x 18 ' cargo net under a Type III helicopter?
- Was the spacing on the wattles correct and according to manufacturer recommendations?

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: No underline

Formatted: Bullets and Numbering

Formatted: No underline

Formatted: Underline color: Auto

Formatted: Underline, Underline color: Auto

Formatted: Indent: Left: 0.25", Tab stops: 0.25", Left + Not at 0"

Formatted: Underline color: Red

Formatted: Bullets and Numbering

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline, Underline color: Auto

Formatted: Indent: Left: 0.25", Tab stops: 0.25", Left + Not at 0"

Formatted: Underline

Formatted: Bullets and Numbering

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline

Formatted: Underline, Underline color: Red

Formatted: Indent: Left: 0.25", Tab stops: Not at 0"

Formatted: Bullets and Numbering

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Underline color: Red

Formatted: Bullets and Numbering

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

o **Seed Mix Used for Hand Seeding of Riparian (*)**

Plant Species	Pounds PLS / acre	Cost per Pound	Cost per Acre
Cereal Barley	35	\$0.30	\$10.50
Blue Wildrye	1	\$4.25	\$4.25
Kentucky Bluegrass	1	\$1.00	\$1.00
Thickspike Wheatgrass	2	\$2.00	\$4.00
Creeping Wild Rye	2	\$7.25	\$14.50
Seed Total (~\$34.25 / acre for 23 acres)			\$788.00
Misc. supplies (rakes, 1 belly grinder, gloves, PPE)			\$250.00
Total Seed Mix and Supplies			\$1,038.00

o **Seed Mix Used for Hand Seeding of Uplands (*)**

Plant Species	Pounds PLS / acre	Cost per Pound	Cost per Acre
Cereal Barley	30	\$0.30	\$9.00
Mountain Brome	4	\$2.25	\$9.00
Slender Wheatgrass	4	\$1.50	\$6.00
Blue Wildrye	0.5	\$4.25	\$2.13
Sandberg Bluegrass	1	\$3.50	\$3.50
Thickspike Wheatgrass	2	\$2.00	\$4.00
Seed Total (~\$33.63 / acre for 39 acres)			\$1,312.00
Misc. supplies (rakes, 1 belly grinder, gloves, PPE)			\$250.00
Total Seed Mix and Supplies			\$1,562.00

Please see the Initial and Interim #1 Reports.

o **Seed Mix Used for Helicopter Seeding of Uplands (*)**

Plant Species	Pounds PLS / acre	Cost per Pound	Cost per Acre
Cereal Barley	30	\$0.30	\$9.00
Mountain Brome	4	\$2.25	\$9.00
Slender Wheatgrass	4	\$1.50	\$6.00
Blue Wildrye	0.5	\$4.25	\$2.13
Sandberg Bluegrass	1	\$3.50	\$3.50
Thickspike Wheatgrass	2	\$2.00	\$4.00
Seed Total (~\$33.63 / acre for 923 acres)			\$31,040.00
Misc. supplies (flagging, target flags, 8 rolls plastic covreing)			\$1,000
Total Seed Mix and Supplies			\$31,040.00

* **NOTE:** Seed mixes were developed with the intention of: 1) providing quick cover for high and moderate intensity burn areas, 2) breaking up hydrophobic soil conditions on high intensity burn areas, 3) reducing sediment transport from the burn area, 4) reducing impacts to downstream water quality and aquatic habitats, 5) reducing the risk of noxious weed establishment within the burn area, and 6) following 2003 Uinta National Forest Land and Resource Management Plan Goals, Objectives, Standards and Guidelines for vegetation management.

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0.5", Tab stops: Not at 0"

Formatted: Bullets and Numbering

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

♦ Channel Treatments ... place 1, 080 feet of channel fence in the drainages of Bear Canyon and Provo-Deer Creek along the tributaries leading into the drainage from the landslide bench. (\$ 16,200)

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Bullets and Numbering

Roads and Trail Treatments ... in areas along the paved road leading into the FS / Cascade Springs site from the Sundance Resort, clean culverts along 4.3 miles of the road (\$7, 998); re-condition 3.78 miles of road surface affected by the burning disturbance in Bear Canyon (\$15, 220); replace and enlarge 1 culvert located under the paved road surface (\$16, 952); replace and enlarge 1 culvert located under a native road surface (\$6, 460); use 20 yd ³ to riprap culvert inlets at several locations on NFS lands (\$2, 860); install 600 linear feet of diversion ditches around a septic drainfield to protect the Cascade Springs site from accelerated rates of erosion (\$1, 260); obliterate 0.59 miles of road on Wasatch Mountain State Park (\$4,900; Wyden Authority area); channel-shaping and stabilization activities above the road at Cascade Springs (\$3, 180); to prevent a loss of water control and spend 20 days on contract administration. (\$7,560) (Total ...\$66,390)

Formatted: Bullets and Numbering

These treatments will also be reviewed during implementation to assure compliance with contract specifications. Most importantly, COR inspectors will determine if the road treatments (culvert cleaning and / or replacement, re-conditioning of the transportation surfaces, constructing waterbars with hand crews etc.) were completed in a timely manner. (Total...\$200)

Formatted: Bullets and Numbering

♦ Structures ... None (\$ 0)

Formatted: Bullets and Numbering

I. Monitoring Narrative:

Formatted: Font: Bold

(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)

Please see Initial BAER for year 1 monitoring requests.

General Observations of fire area to date:-

Formatted: Indent: Left: 0.5"

Observations indicate the hillslope treatments (seeding, mulching and wattles) were successful in protecting against rill and sheet erosion. No additional treatment needs for these areas were identified.

Hydrophobicity has declined, but still remains a concern in a few areas.

Channel v-mesh structures were generally successful in accomplishing their intended purpose. Some maintenance of structures is still needed, and 1 structure needs to be replaced. In one drainage, a need for a 2-3 additional structures was identified. (Funding for these was requested and approved in Interim #1).

Road treatments were generally successful. The waterbarring and enlarged culverts worked, though some waterbars need to be cleaned out and in a few locations

During Year # 1, monitoring activities need to be conducted in connection with the IMPLEMENTATION of authorized BAER treatments on NFS lands.

The aerial seeding needs to be reviewed to determine if the correct seed mix was actually applied to the intended landscapes; secondly, monitoring will indicate if the aircraft selected for the job effectively seeded

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim Initial BAER Report 9/17/2013 11/29/2004 10/28/2004 10/27/2004 10/16/2003 10/13/2003

Cascade II Fire Incident

Page 22

7

Interim 2 BAER Report – Cascade 2 Fire Incident

~~the recommended treatment areas. Monitoring needs to review whether or not the 45 ft³ / Isolair Seeding Bucket (helicopter operations) or seeding hopper (fixed-wing) were correctly calibrated at a rate of 60 seeds / ft² for the seeding operation. Was the seed purchased certified to be free of noxious weed species? Was the seed tested for its germination rate. Were the Helitack and ground crew of sufficient number to support the operation? Was the proper Helispot selected for the mission with respect to safety and turn-around time between flights. Was the seed protected from moisture prior to its application on the ground? What was the soil moisture content at the time of the seeding? What were the weather conditions at the time of seeding especially wind speed and wind direction. How did the pilot keep track of his flight lines... on-board GPS unit, orange flagging dropped from the seeding bucket or support crew working on the ground. Was the seed pre-coated with a micronutrient powder to enhance its germination rate?~~

~~The aerial mulching treatment needs to be monitored for its rate of application (1 ton / acre) on severely burned landscapes. Did the treatment achieve its objective of getting 60 to 70 % ground cover within the HIGH burn severity zones? Was the straw product certified to be free of noxious weeds? What was the moisture content of the straw at the time of application; was it considered ideal for spreading the mulch? Was the aircraft selected for the job (i.e. Kmax, Long Ranger 206 / L-1, A Star / B-3, Bell 205 etc) considered to be appropriate?~~

~~(Note) we suggest using an A-Star / B-3 helicopter for its incredible functionality and reasonable cost to spread the straw mulch. From past experience, we know the aircraft is suited for this type of mission because it has ample lift and maneuvers well in our high elevation, mountainous type terrain.~~

~~Was the straw delivered to the staging area / helispot when it was needed for the treatment? Did the mulching by hand achieve the desired results at the FS / Cascade Springs Recreation Site? Should more of the burned area have been treated with mulching by hand using a Type II Fire Crew? Was the application rate of the mulch at 1 ton / acre really appropriate on NPS lands. Should a rate of 1 1/2 tons / acre be applied to the steeper terrain of Bear Canyon for erosion control measures. Should more acres have been treated in the burn? Could the job have been accomplished using straw wattles or log erosion barriers?~~

~~Were the correct number of straw wattles applied to the landscape? Did these physical barriers straw wattles actually limit erosion and trap sediment at Cascade Springs to protect the FS / Recreation Site? Were the wattles staked down into the ground every 4 feet using 24" wood stakes? Were the wattles placed flush against the ground surface? Was the site prepped before the treatment was implemented? Were the wattles effective in protecting the water quality of Deer Creek Reservoir and Provo Deer Creek. Could silt fences have been used more effectively? Would straw bale check dams have worked better. ? Did upland big game animals (deer, elk and moose) disturb the wattles after the treatments were implemented? How many wattles could the Helitack Crew safely sling at one time using an 18 x 18' cargo net under a Type III helicopter? How many ft³ of soil material was trapped as sediment behind the wattles? Could the trapped sediment be used for reforestation activities? Would contour raking using McLeods have been a better treatment to limit water repellent ground conditions vs. using the wattles to trap sediment. Were the wattles placed on terrain considered to be too steep. Was the spacing on the wattles correct and according to manufacturer recommendations. Were 30" wood stakes required to anchor the wattles in some areas?~~

~~Were the roading treatments (culvert cleaning and / or replacement, re-conditioning of the transportation surfaces, constructing waterbars with hand crews etc.) completed in a timely manner? Was the right size selected for the culvert replacements? Should more road closure gates have been recommended by the BAER Team? Should additional roads or trails be obliterated within the burned area? Was it appropriate to re-open the burned area to vehicular travel following control of the fire? Did the culverts get cleaned under the Heber Valley Railroad? Were there any issues related to water quality in either Deer Creek~~

Interim 2 BAER Report – Cascade 2 Fire Incident

~~Reservoir or Provo Deer Creek associated with the transportation surfaces? Did the roading treatments suggested ... match the anticipated flows of a 2 Year, 5 Year or 10 Year storm event?~~

~~Did the areas of concern for noxious weeds get monitored in a timely manner by the Ecologists or Botanists? Did the fire disturbance cause these weeds to spread across the landscape? What plans does the Forest have to eradicate these undesired plant species? Has the location of these noxious weeds been entered into the corporate GIS database for future BAER monitoring activities? If the distribution of noxious weeds becomes a significant problem following the burn ... does the project need to be entered into the NFPORS Database to request NFP / KP2 funding to address the issue.~~

~~(Year 1 ... \$17,81010,610)~~

~~During Years 2 and 3, the Uinta National Forest will continue to monitor the EFFECTIVENESS of the implemented BAER treatments. What species worked well within the broadcast seeding. Did we get new vegetation occurring in the treatment areas from the seeding? Was the straw mulch effective at limiting accelerated rates of erosion from the burned area. Are the noxious weeds spreading throughout the burn? This would be an opportunity to set up several photo points within the burned area. Monitoring would take place during storm events, following storm events and throughout the spring, summer and fall seasons. A final report would be prepared by the Forest following 3 years of making monitoring observations. Monitoring results would be shared with other Ranger Districts, Forests, Regional Offices and the Washington Office. An Interim BAER Report would be submitted in Years 2 and 3 in order to acquire the additional monitoring funds needed to complete the task.~~

~~(Year 2 ... \$12,750 and Year 3... \$12,750)~~

~~A detailed MONITORING PLAN has been included with this Initial BAER Report which discusses all of the intended actions currently being planned by the resource specialists and staff of the Pleasant Grove Ranger District; the plan includes a financial table which itemizes all the expected costs associated with conducting monitoring activities for a 3 year period of time. If necessary, the plan will be modified to reflect changes in the FS / BAER program ... or, if additional treatments are implemented in the burned area based upon the findings of an Interim BAER Report.~~

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Interim Initial BAER Report
9/17/2013 11/29/2004 10/28/2004 10/27/2004 10/16/2003 10/13/2003
Cascade II Fire Incident

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Page 25 7

Part 6 – Emergency Stabilization Treatments and Source of Funds by Land Ownership

See Initial and Interim #1 for treatments and funding associated with those requests. See enclosed Table 2 for accomplishments and expenditures relative to those requests.

Interim #2 Funding Requests

Table 1. Cascade II/ BAER -NFS Lands

Line items	Units	Unit Cost	# of Units	WFSU SULT \$
A. Land Treatments				
Clean and replace Straw Wattles Helicopter Seeding NFS Lands (BAER Funded) and State and Private Lands in L. Provo Deer Creek Subdrainage (BAER Wyden funded)	acrefeet	\$95.00 10.00	167 100	\$15,865 1000.00
Fixed-wing high elevation seeding	acre	\$63.67	144	\$9,168
Hand seeding riparian	acre	\$258.00	10	\$2,580
Hand mulch riparian	acre	\$647.00	10	\$6,470
Helicopter Mulching NFS Lands (BAER Funded) and State and Private Lands in L. Provo Deer Creek Subdrainage (BAER Wyden funded)	acre	\$917.00	138	\$126,546
Straw wattles with helicopter transport (5,000' in moderate intensity area west of Provo Deer Creek)	feet	\$4.60	5000	\$23,000
Straw wattles (5,000' along riparian area below moderate intensity area west of Provo Deer Creek; and 1,000' along base of high intensity area east of Provo Deer Creek and south of Cascade Springs)	feet	\$2.10	6000	\$12,600
Cascade Springs clean ditch	site	\$200.00	1	\$200
Cascade Springs straw wattle	feet	\$2.10	5000	\$10,500
Cascade Springs V-mesh fence	feet	\$15.00	60	\$900
Cascade Springs hand seed	acres	\$258.00	39	\$10,062
Cascade Springs hand mulch	acres	\$647.00	39	\$25,233
COR inspector	ea	7000	1	7,000
Subtotal Land Treatments				\$0.00 1000.00\$243250.124
B. Channel Treatments				
Channel fence (30' fences w/ 5 in The Cove drainage; 8 in Bear Canyon; 5 ea. at mouth of Tribs 1 & 2; 4 in two drainages in mod burn area w of Provo Deer Cr) Repair 10-15 V-mesh fences and construct 2-3 new fences	feeteach	\$444.00 15.00	810 5	\$12,150 2250.00
Subtotal Channel Treatments				\$225 0.00\$12,150
C. Roads and Trails				
Clean culverts and open debris basins Reconstruct Waterbars and Repair Culvert Outlets	milesJob	\$1,860.00 \$2220.00	4.31	\$7,998 2220.00
Recondition road, mechanical	miles	\$4,026.00	3.03	\$12,199
Install 36" culvert, asphalt surface	linear feet	\$326.00	52	\$16,952
Install 36" culvert, native surface	linear feet	\$64.60	100	\$6,460
Riprap culvert inlet and outlet	Cu-Yd	\$143.00	20	\$2,860
Channel shaping and restoration	site	\$3,180.00	1	\$3,180
Install diversion ditches around septic drainfield	linear feet	\$2.10	600	\$1,260
Survey, Design, and Contract Administration	day	\$280.00	2728	\$7,56840
Subtotal Roads & Trails				\$8222 0.00\$58,46749

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Font: Not Bold

Formatted: Font: Bold

Formatted Table

Formatted Table

Formatted Table

Formatted Table

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim 2 BAER Report – Cascade 2 Fire Incident

Line items	Units	Unit Cost	# of Units	WFSU SULT \$
D. Structures				
<u>Subtotal Structures</u>				<u>\$0.00</u>
E. BAER Evaluation				
FS BAER team (survey and initial report)	days	\$4,550.00	13	\$59,150
FS BAER team (travel)	days	\$118.50	34	\$4,029
FS BAER supplies	Each	2357	1	\$2,357
FS BAER helicopter	hr	\$675.00	1.5	\$1,013
Subtotal Evaluation				<u>\$0.00</u> <u>\$66,549</u>
F. Monitoring				
Soil and Hydrology	Job	5710	1	\$5,710 <u>\$210</u>
Erosion Control Seeding	Job	8650	1	\$8,650 <u>\$150</u>
Noxious Weeds	Job	1900	1	\$1,900
Archaeological Sites	Job	850	1	\$850
Engineering	job	700	1	\$700 <u>\$440</u>
Subtotal Monitoring	<u>Report</u>	<u>\$12,750.00</u>	<u>1</u>	<u>\$12,750.00</u> <u>\$17,810</u> <u>\$10,530</u>
G. Totals				\$12,753,398 \$5,470,001 \$102

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted Table

Formatted: Font: Not Bold

Formatted: Right

Formatted Table

Formatted: Font: Not Italic

Formatted Table

Formatted: Font: Not Italic

Formatted: Font: Not Italic

Formatted: Font: Not Italic

Table 2. Cascade II / BAER - Wyden Authority Area – Private and State Park Lands

Line items	Units	Unit Cost	# of Units	WFSU SULT \$
A. Land Treatments				
<u>Subtotal Land Treatments</u>				<u>\$0.00</u>
Helicopter Seeding NFS Lands (BAER Funded) and State and Private Lands in L. Provo Deer Creek Subdrainage (BAER-Wyden funded)	acre	\$95.00	756	\$71,820
Hand seeding riparian	acre	\$258.00	1	\$258
Hand mulch riparian	acre	\$647.00	1	\$647
Helicopter Mulching NFS Lands (BAER Funded) and State and Private Lands in L. Provo Deer Creek Subdrainage (BAER-Wyden funded)	acre	\$917.00	352	\$322,784
Straw wattles (4000' along Provo Deer Creek in high intensity area north of Cascade Springs road)	feet	\$2.10	4000	\$8,400
Subtotal Land Treatments				<u>\$403,900</u>
B. Channel Treatments				
<u>Subtotal Channel Treatments</u>				<u>\$0.00</u>
Channel Fence (30' fences w/ 5 in Thomas Canyon and 4 at head of Trib 1)	feet	\$15.00	270	\$4,050
Subtotal Channel Treatments				<u>\$4,050</u>
C. Roads and Trails				
<u>Subtotal Roads & Trails</u> Reconstruct Waterbars and Repair Culvert Outlets Recondition road, mechanical	<u>miles</u> <u>job</u>	<u>\$4,026.40</u> <u>\$1280</u>	<u>0.75</u> <u>1</u>	<u>\$0.00</u> <u>\$3,020</u> <u>\$1280</u>
Reconstruct Ridgetop Road/Deer Creek Campground Road Drainage	Job	\$5620	1	\$5620
Close ATV Trail	Each	\$5735	1	\$5735
Subtotal Roads & Trails Obliterate road	miles	\$1280\$8,305.08	-0.59	\$12635\$4,900
D. Structures Subtotal Roads & Trails				<u>\$7,920</u>
Subtotal Structures				<u>\$0.00</u>
E. BAER Evaluation				
Subtotal BAER Evaluation				<u>\$0.00</u>
F. Monitoring				
E. BAER Evaluation				

Formatted Table

Formatted: Font: Not Bold

Formatted: Right

Formatted: Font: Not Bold

Formatted: Right

Formatted Table

Formatted: Font: Not Italic

Formatted: Left

Formatted: Right

Formatted: Right

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Interim Initial BAER Report 9/17/2013 11/29/2004 10/28/2004 10/27/2004 10/16/2003 10/13/2003
Cascade II Fire Incident

Interim 2 BAER Report – Cascade 2 Fire Incident

<u>Subtotal Monitoring</u>				\$0.00
<u>G. Totals</u>				\$0.00
<u>G. Totals</u>				\$4152,635879

Costs for monitoring Wyden Authority Area are included costs for monitoring NFS lands.

Table 3. Cascade II NRCS – EWP

Line-items	Units	Unit Cost	# of Units	EWP (\$)
A. Land Treatments				
Helicopter seeding – State and Private Lands (EWP funds)	acre	\$123.00	1007	\$123,861
Fixed-wing low elevation seeding	acre	\$95.36	1768	\$168,596
Hand seeding riparian	acre	\$214.00	12	\$2,568
Helicopter mulching – State and Private Lands (EWP funds)	acre	\$448.00	652	\$202,096
<u>Subtotal Land Treatments</u>				\$587,121
B. Channel Treatments				
Channel fence	feet	\$15.00	30750	\$461,250
<u>Subtotal Channel Treatments</u>				\$461,250
C. Roads and Trails				
Recondition road, mechanical	miles	\$4,026.40	3.67	\$14,777
Recondition road, salvage/replace existing gravel, mechanical	miles	\$4,026.40	0.46	\$1,852
Clean culverts and open debris basins, railroads	miles	\$3,443.27	3.79	\$13,050
Riprap culvert inlet and outlet	Cu-Yd	\$143.00	28	\$4,004
<u>Subtotal Roads & Trails</u>				\$33,683
D. Structures				
E. BAER Evaluation				
F. Monitoring				
<u>G. Totals</u>				\$1,082,055

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

Formatted: Right

Formatted: Font: Bold

Formatted: Right

Formatted: Indent: Left: 0.5", Tab stops: 0.5", Left + Not at 0"

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

Formatted: axNormal

Formatted: axNormal, Left

PART 7 ... APPROVALS

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

1. **Forest Supervisor:** /s/ Peter W.
Karp

Date: 10/28/04

Formatted: Tab stops: 2.99", Left

Formatted: Underline

Formatted Table

Formatted: Underline

Formatted: Left

2. **Regional Forester:** /s/ Erin D.
O'Connor for

Date: 11/24/2004

Formatted: Tab stops: 3", Left

Formatted: Underline

Formatted: Left

Formatted Table

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Italic

Formatted: Font: 10 pt, Italic

PART 7 ... APPROVALS

1. Forest Supervisor: /s/ Pete W. Karp Date: July 26October 10,
20043

2. Regional Forester: /s/ William P. LeVere Date: July 29, 2004
for

Formatted: Font: 10 pt

Formatted: Font: 10 pt, Not Italic

Formatted: Right: 0.25"

Formatted: Font: 10 pt