

Edited JBruggink 09/06/2006

Date of Report: 09/05/2006

**BURNED-AREA REPORT**  
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST****A. Type of Report**

- ☒ 1. Funding request for estimated emergency stabilization funds  
☐ 2. Accomplishment Report  
☐ 3. No Treatment Recommendation

**B. Type of Action**

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures) – NOTE: The forest got a verbal pre-approval for signing and emergency road work (see attached). The total funds authorized in the pre-approval have been subtracted from the 2500-8 in this request.
- ☐ 2. Interim Report #\_\_\_\_.  
    ☐ Updating the initial funding request based on more accurate site data or design analysis  
    ☐ Status of accomplishments to date
- ☐ 3. Final Report (Following completion of work)

**PART II - BURNED-AREA DESCRIPTION****A. Fire Name:** Devil's Den**B. Fire Number:** UT-FIF-000435**C. State:** Utah**D. County:** Millard**E. Region:** 04**F. Forest:** Fishlake National Forest**G. District:** Fillmore**H. Fire Incident Job Code:** P4C39U**I. Date Fire Started:** August 15, 2006**J. Date Fire Contained:** August 29, 2006**K. Suppression Cost:** \$ 4,200,000 as of August 29, 2006.**L. Fire Suppression Damages Repaired with Suppression Funds**

1. Dozer Fireline waterbarred (miles): 20.3 [19.7 miles of rehab is not yet complete]
2. Dozer Fireline seeded (miles): 21.5
3. Other (identify): Brush piles chipped - 3.6 miles, Dense brush piles to be chipped - 1.7 miles

**M. Watershed Number:** 160300515**N. Total Acres Burned:** 14,154

[12,483] NFS Acres

[1,410] BLM

[0] State

[261] Private

- O. Vegetation Types:** Pinyon-Juniper/Gambel Oak (54%), Mountain Big Sagebrush/perennial grasses (13%), Pinyon-Juniper/Mountain Big Sagebrush (10%), Wyoming Big Sagebrush/Desert Shrubs (8%), Pinyon-Juniper/Mixed Conifer (5%), Juniper/Black Sagebrush (4%), Gambel Oak/Mountain Big Sagebrush (2%), other sage communities and irrigated croplands (4%).
- P. Dominant Soils:** The upland soils mapped under the Pinyon-Juniper / Gambel Oak community were classified as Pachic Argixerolls, Calcic Argixerolls and Calcic Pachic Argixerolls; the gravelly soils observed under the Mountain Big Sagebrush and perennial grasses were the Typic Argixerolls and Typic Calcixerolls; the semidesert soils occurring under the Wyoming Big Sagebrush and Desert Shrubs were Xeric Haplocalcids and Xeric Torriorthents; the high elevation Pinyon-Juniper / Mixed Conifer sites had Typic Argicryolls, Typic Haplocryolls, Lithic Haplocryolls and Typic Haploxeralfs; the droughty Juniper / Black Sagebrush areas had Lithic Xeric Haplargids, Lithic Xeric Calciorhids and Lithic Xeric Torriorthents while the remaining areas of Pinyon – Juniper, Gambel Oak and Mountain Big Sagebrush had Aridic Calcic Argixerolls and Aridic Argixerolls. Most of the soils that were mapped in the burned-area had a mesic or frigid temperature regime and a xeric moisture regime.
- Q. Geologic Types:** Most of the soils occurring within Limekiln Canyon and The Narrows were derived from metamorphic deposits of Tintic Quartzite – meaning that once these hard rock sites finally weather into unconsolidated sediments, the area is dominated by sandy textured soil material. The remaining foothills and mountainsides were derived from Maxfield Limestone and the secondary mineral Dolomite – indicating, the presence of calcareous, loamy textured soils. The quartzite sites can be susceptible to mudslides following a wildfire – while the limestone / dolomite areas are prone to debris flows ( e.g. Buck Hollow / Netties Canyon, 1994 - 2001 ). The fan terraces located along the western edge of the burned-area were formed in mixed alluvial sediments.

**R. Miles of Stream Channels by Order or Class:**

1<sup>st</sup> Order: 55.3, 2<sup>nd</sup> Order: 26.9, 3<sup>rd</sup> Order: 8.9, 4<sup>th</sup> Order: 18.5, 5<sup>th</sup> Order: 0

**S. Transportation System**

**Motorized Trails:** 8.5 miles

**Roads:** 15.1 miles

**PART III - WATERSHED CONDITION**

- A. Burn Severity (acres):** 2,768 (unburned) 8,221 (low) 2,515 (moderate) 650 (high)
- B. Water-Repellent Soil (acres):** 1,500
- C. Soil Erosion Hazard Rating (acres):** 11,240 (low) 1,761(moderate) 1,153 (high)
- D. Erosion Potential:** 11 tons/acre
- E. Sediment Potential:** 1,200 cubic yards / square mile

#### **PART IV - HYDROLOGIC DESIGN FACTORS**

<b>A. Estimated Vegetative Recovery Period, (years):</b>	5
<b>B. Design Chance of Success, (percent):</b>	65
<b>C. Equivalent Design Recurrence Interval, (years):</b>	2
<b>D. Design Storm Duration, (hours):</b>	1
<b>E. Design Storm Magnitude, (inches):</b>	0.58
<b>F. Design Flow, (cubic feet / second/ square mile):</b>	1
<b>G. Estimated Reduction in Infiltration, (percent):</b>	17
<b>H. Adjusted Design Flow, (cfs per square mile):</b>	93

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

##### **A. Describe Critical Values/Resources and Threats (narrative):**

###### **Threats to Life and Property**

Field reviews within the burned area and downstream of the wildfire confirm that threats to human life are possible from flooding and debris flows. Moderate and high burn severities occurred in Devil's Den and Limekiln canyons, which are inherently debris-flow prone. Forest Road 089, which is the primary access to the western portion of the Canyon Mountains, crosses the mouths of these basins. Flash floods or debris flows could entrap, or injure forest users in addition to damaging the road. Hazardous areas include Devil's Den and Limekiln Canyons, Forest Road 089, and the Oak Creek floodplain. Users at Oak Creek campground would be safe unless they were in the creek when a flood event occurred. Even so they could become entrapped if sediment and debris from Devil's Den covered road 089. An event in Limekiln could entrap users in Oak Creek above the campground.

Several road crossings below the forest constrict Oak Creek, but would not divert flows out of the floodplain if they failed. On private lands, there is potential for individual crossing failures to cause a cascade of failures downstream. Even with the constrictions and potential for crossing failures, Oak Creek channel and floodplain capacity appears to be sufficient to avoid risks to residents of Oak City provided they are not in the channel during a flood.

Generally low burn severities and two flood control structures protects residents below Fool Creek, although one of the control structures needs maintenance in order to be fully effective. An agreement signed by the Fool Creek Irrigation Company on January 7, 2001 specifies that the water users are responsible for this maintenance.

Water lines for irrigation and culinary water run down Oak Creek and Fool Creek road and are only buried to depths of 1 to 2 feet. There is some risk that surface flow intercepted by the road or from scour at channel crossings could expose portions of these lines. There are

irrigation diversions, canals, and stock ponds and troughs on forest and private lands. Increased flows and sediment could cause canal breaches or filling and may fill in the ponds and increase maintenance on troughs. The pond detainment structures have a low risk of collapsing though a catastrophic breach. Some roads within the burn perimeter will intercept, concentrate, and reroute water which could increase stormflow peaks and slope erosion potential. The increased runoff and erosion could also damage the road template. The culvert on the Oak Creek campground access route is the only structured crossing on National Forest Systems lands. Field reviews and hydrologic analysis indicates this structure should have adequate capacity to pass a 5-year post-fire flood. One cultural site was exposed through removal of concealing vegetation during fireline construction. The site could be impacted by vandalism.

#### Threats to Long-Term Soil Productivity and Ecosystem Function

Successful seedlings from past fires along with clonal vegetation within the Devil's Den fire perimeter are generally expected to reestablish, especially given the large amount of low and unburned areas. However, field reviews indicate potential threats to long-term soil productivity and ecosystem function exist in portions of the fire in particular, where cheatgrass is already well established. Cheat grass and noxious weeds are primary concerns along dozer lines and adjacent to existing populations of musk thistle, squarrose knapweed, hoary cress, and field bindweed. There are also areas where stand-replacing fire burned through decadent pinyon-juniper that may not have enough viable seed in the soil to provide post-fire vegetative recovery. Areas invaded by noxious weeds can lead to a decline in effective ground cover. This could increase erosion and reduce soil productivity and desired ecosystem function, and could decrease the habitat value of the critical deer winter range burned by the fire.

#### Threats to Water Quality

There are no perennial streams within the fire perimeter although Oak Creek flows along the southern boundary of the fire. A culinary spring for Oak City and the Oak Creek campground is adjacent to the fire boundary, but is not at risk given its location. Three culinary spring sources for Fool Creek and Leamington are located within the fire perimeter. Most of the source areas above the springs in Fool Creek burned with low severity. Two of the three points-of-diversion are not at risk from flooding given the structure locations and the minimal amount of moderate to high severity burn in the source area. There is a low risk that Black Willow spring could be impacted by channel migration during a post-fire flood, but this does not seem likely given the response from past fires that had higher severities than Devil's Den. Both Oak and Fool Creeks are diverted into irrigation ditches at the National Forest boundary. Any water quality impacts to the irrigation beneficial use are expected to have a short duration. Impacts to Oak Creek fisheries could be more substantial, especially if a debris flow is generated in either Devil's Den or Limekiln Canyons.

#### Cumulative Threats to Critical Values and Resources

The Devil's Den and Oak City Canyon wildfires create cumulative impacts to Oak City and resources managed by the Forest Service. The 9,740 acre Oak City Canyon fire that occurred in July of this year burned immediately to the south of the 14,154 acre Devil's Den fire. The Oak City BAER report is incorporated by reference. Cumulative impacts include the following:

- ★ Most of the moderate and high severity burn from the Oak City Canyon fire occurred in Dry Creek. The town of Oak City is considering use of Oak Creek as an overflow channel to prevent flooding from Dry Creek which drains into the irrigation canal that runs directly through town. A single storm cell could rain over both fires in a short period of time creating combined flood flows in Oak Creek that are greater than would occur individually.
- ★ Oak City Canyon burned 6,480 acres of critical mule deer winter range as mapped by the Utah Division of Wildlife Resources. An additional 4,715 acres burned in the Devil's Den fire for a combined total of over 11,000 acres. This represents 36 percent of the total habitat available on the western half of the Canyon Mountain range. This could impact deer herd numbers and condition. **This value at risk is outside of the BAER program.**
- ★ The two fires collectively burned all or portions of all 5 pastures that comprise the Oak Creek allotment. Grazing systems will have to be modified and seasons shortened significantly in order to permit post-fire recovery of the affected rangelands.

An administrative impact is that the Fillmore Ranger District has so far had 5 project fires in 2006 that require emergency treatments. The forest is shifting resources and priorities to accommodate these needs.

#### **B. Emergency Treatment Objectives (narrative):**

The emergency treatment objectives are 1) to reduce threats to human life and property in and around Oak City, Fool Creek, and on National Forest System lands; 2) to maintain soil productivity by preventing erosion and the expansion of noxious weeds and invasive plants in the burned area; and 3) to reduce concentration of water and subsequent erosion on and below forest routes within the fire perimeter.

#### **C. Probability of Completing Treatment Prior to Damaging Storm or Event:**

**Land 60%   Channel 60%   Roads/Trails 60%   Protection/Safety 60%**

#### **D. Probability of Treatment Success**

	Years after Treatment		
	1	3	5
<b>Land</b>	50	80	90
<b>Channel</b>	70	50	40
<b>Roads/Trails</b>	90	80	70
<b>Protection/Safety</b>	90	90	70

**E. Cost of No-Action (Including Loss):** 1,800,000

**F. Cost of Selected Alternative (Including Loss):** 706,000

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

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range
<input type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS

**Team Leader:** Dale Deiter

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**H. Treatment Narrative:**

(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

**Land Treatments:**

- *Aerial Seeding and Aerial Seeding with Mulch*

**Method**

These treatments are focused on areas within the Devil's Den fire where life and property risks are greatest (see threats to life and property in Part V – A). The helibase used for Devil's Den is the recommended operational staging area. One seed mix is planned for both treatment types. The mix includes native and introduced species that will be applied using a Type 3 helicopter. For safety and economic reasons, a Type 2 helicopter will be used to apply the mulch. Seed only treatments will be applied in the fall, preferably just before snowfall. The mulch areas need to be implemented as soon as possible, therefore seeding on those areas will occur sooner. Based on the success of past treatments in this area, the seeding should reduce erosion and flood response on areas with moderate or higher burn severities, especially where combined with 1.0 tons per acre of noxious weed free straw mulch. Seeding and seed with straw mulch should reduce the amount of time needed to reestablish protective ground cover, which will reduce sediment hazards to values at risk in Oak Creek and should reduce the ability of noxious weeds and cheatgrass to expand within the sites treated. Areas with pinyon-juniper and mountain brush that experienced stand replacing fire will be seeded since these areas likely do not have an adequate seed bank of understory species that can reestablish quickly. This includes slopes burned with high and moderate severity Bridge Canyon and by Mohagany Hollow, which are potential flood source areas to residences near Oak City. Seeding only treatments would cover about 737 acres while 251 acres would be seeded and mulched.

This seed mix includes the recommendations of Stan Kitchen (Botanist, Rocky Mountain Research Station, Shrub Sciences Lab, Provo) on July 25 and August 17, 2006 along with suggestions from District, Forest, and Regional Office specialists. We referred to seed mixes previously used on the Forest (particularly, the BAER seeding projects for

the Black Willow Fire—1994, the Leamington Canyon Fire—1996, and the Mourning Dove Fire—2000, as well as mixes approved for Oak City Canyon, Dog Valley, Sunset, and Magpie fires all in 2006). We also included information from the Tushar-Pahvant-Canyon Soil Survey Manuscript (draft), the Interagency Forage and Conservation Planting Guide for Utah, and the Intermountain Planting Guide, both from Utah State University Cooperative Extension Service, while designing these seed mixes to achieve the FSM objectives listed above. Based on comparisons with untreated areas, seeding treatments proved effective in most cases on the 1981 Clay Springs, 1994 Black Willow, 1996 Leamington Complex, and 2000 Mourning Dove wildfires, which include burned areas within the same perimeter as the Devil's Den fire.

Most of the seed mix will be applied in areas that receive about 18 to 24 inches of precipitation annually. Our monitoring from other burned areas in the Canyon Range show that several of the species in this mix each have the ability to dominate a stand depending on the location. This underscores the value of multiple species in the seed mix. This provides the flexibility for different species in the seed mix to thrive in a microsite that is best suited for that certain species.

Specific ecological attributes valued for some of the recommended species include the following:

Big bluebunch— “often found growing on drier, infertile, open side hills, and waste places...noted for its early spring growth...used successfully for reseeding burned-over forest lands”

Sandberg bluegrass—“important for soil stabilization and forage for wildlife...one of the first grasses to green-up in the spring...excellent in low rainfall native mixes”

[These two bluegrasses should be competitive with cheatgrass likely to increase in the area.]

Mountain brome— “establishes quickly on disturbed sites...will establish and grow on rather poor, depleted soils, where water is limiting... recommended sites include weedy openings”

Bluebunch wheatgrass— “long-lived, drought tolerant...widely adapted... one of the most valuable native range grasses”

Slender wheatgrass— “rapid seed germination and establishment... commonly used as a component of a mix in fire rehabilitation... tolerates a wide range of conditions”

Thickspike wheatgrass— “drought tolerant...good seedling vigor... readily establishes on critically disturbed sites”

Crested wheatgrass— Hycrest is “a hybrid between standard and introduced... outstanding seed producer, excellent seedling vigor, easy to establish under harsh conditions”

Orchardgrass— “adapted to pinyon-juniper and mountain brush... greens up early in the spring”

Alfalfa— “because of its ability to fix nitrogen, alfalfa improves soil fertility”

Small burnet— “non-leguminous...perennial winter-active forb... can grow on low fertility soils”

We constrained the total number of acres to be seeded with these guiding factors:

- Seed areas in Limekiln, Devil’s Den, and Bridge canyons that had high burn severity and some moderate burn severity.
- Seed areas where pre-burn pinyon and juniper stands lacked adequate grass seedbank.
- Generally, omit acres burned that were deemed to have adequate grasses present in the pre-burn plant community.

#### Objective

1. Shorten the time required for hydrologic recovery to reduce the risk to human life and property from flooding and debris flows.
2. Promote infiltration by providing more tortuous flow paths and by preventing surface sealing of soils during rainstorms in flood source areas and by promoting vegetative recovery.
3. Meet Forest Plan standards for weed and invasive plant control using a least cost to risk strategy.
4. Protect long-term soil productivity.

Seed Mix – Native and Introduced			
NATIVE or INTRODUCED	COMMON NAME	SCIENTIFIC NAME	PLS LBS/ACRE
Native	Big bluegrass "Sherman"	<i>Poa ampla</i>	0.5
Native	Mountain brome "Bromar"	<i>Bromus marginatus</i>	3
Native	Sandberg bluegrass VNS	<i>Poa sandbergii</i>	0.5
Native	Bluebunch wheatgrass "Goldar" or "Secar"	<i>Agropyron spicatum</i>	1.5
Native	Slender Wheatgrass "Pryor"	<i>Elymus trachycaulus</i>	2
Native	Thickspike wheatgrass "Bannock" or "Critana"	<i>Elymus lanceolatus</i>	0.5



Introduced	Crested wheatgrass "Hycrest"	<i>Agropyron cristatum</i>	2
Introduced	Orchardgrass "Paiute"	<i>Dactylis glomerata</i>	1
Introduced	Alfalfa "Ladak"	<i>Medicago sativa</i>	1
Introduced	Small burnet "Delar"	<i>Sanguisorba minor</i>	1
Total Pounds per Acre			13.0
Total Seeds per Square Foot			64
Estimated Seed Cost per Acre			\$33.50
Estimated Cost of Seed Mix per Pound			\$2.58

The species in this seed mix has been used successfully on the forest in the past for short and long-term erosion control.

- *Herbicide Application*

Method

Potential noxious weed expansion areas within the fire perimeter and along access routes and dozer lines will be treated with herbicides during the first year after containment of the fire to prevent expansion of weed populations. Of the 625 acres monitored, about half of the acres are expected to need treatment. This is to a large degree due to the high mileages of suppression dozer lines, which will be monitored for new populations due to high risk of noxious weed establishment.

Weed and invasive plant expansions are likely due to the loss of protective soil cover caused by the wildfire and due to soil disturbance and possible introduction of weed seeds from fire suppression activities (see map showing the 40 miles of dozer lines). Chemical treatments will reduce expansion into previously unpopulated areas by directly killing new noxious plants. Treatment will occur at the same time as the monitoring. **Bruce Roper of the Fool Creek Water System must be contacted before any chemical treatments within the source areas for Black Willow, Netties, or Upper Narrows culinary springs.**

Funding for herbicide treatments after the first year will be provided either through Key Point 2 dollars or regular appropriations. Note: The Fishlake National Forest has a signed noxious weed EA with provisions for the use of herbicides.

Objective

1. Meet Forest Plan standards for weed and invasive plant control using a least cost to risk strategy.
2. Reduce long-term treatment cost and avoid the resulting impacts to other resource values.
3. Protect long-term soil productivity and critical mule deer winter range.

**Channel Treatments:**

- *Debris Fences*

Method

V-mesh fencing would be staked to steel fence posts and preferably, woody vegetation. The fence posts should be guyed to other posts on the upstream side of the fence. The

intent of the fencing is to slow down or preferably capture course debris that could be delivered below Limekiln and Devil's Den canyons in the event of a debris flow. The fencing should be applied in a shingle pattern or single rows as appropriate. Silt fence should be placed at the bottom of the lowest fences to capture fine sediment.

Objective

1. Prevent course debris from reaching Forest Road 089 to protect human life and the route.
2. Protect the culinary storage tank below Limekiln Canyon.

**Roads and Trail Treatments:**

- *Standard Graded Dips*

Method

Standard grade dips includes additions as well as re-establishing functionality to existing grade dips. These structures are needed and designed to handle increased runoff by dispersing the flows quickly. The 5.8 miles of roads in Fool Creek, and specified locations in Limekiln Canyon are included because they have the greatest need for cross-drainage and because they are in areas that have a greater likelihood of generating overland flow to drainages that flow directly to at-risk values. An estimated 145 standard grade dips are required.

Objective

1. Minimize the ability of roads to exacerbate storm flow and erosional response to the burned slopes to protect human life and property.
2. Reduce potential damage to the road system.

- *Armored Graded Dips*

Method

Armored grade dips are designed to safely pass flood and debris flows across rather than down Forest Road 089 and to safely carry flow to Oak Creek. This helps protect public safety and minimizes potential damage to the road facility. The dips will be designed to drain water off of the road, but still allow motorized vehicle crossing. The dips are typically skewed 30 degrees and the outlets will be armored with riprap. Four overflow dips are needed.

Objective

1. Reduce the length of road where the public could encounter flows and debris from post-fire floods and debris flows.
2. Minimize the ability of roads to exacerbate storm flow and erosional response to the burned slopes and reduce potential damage to the road system.

**Protection/Safety Treatments:**

- *Emergency Warning Weather Station*

Method

A precipitation sensor capable of measuring rainfall intensity will be flown to and located near Helispot 3 at the head end of Limekiln Canyon. The sensor will be equipped with a radio transmitter that can notify Forest Service and Sheriff dispatch centers when 0.2 inches of rain is recorded in 10 minutes. It is expected that a storm of this intensity could cause flooding or trigger a debris flow.

The cost in the 2500-8 reflects purchase of a commercially available [Cambell Scientific](#) unit that includes hardware, software, installation, and maintenance. The preferred option will be for the Forest Service to buy the equipment and for the Sheriffs office to maintain and retain the equipment, which they have verbally agreed to do. If an available RAWS station is used instead, these data can be transmitted to the National Weather Service in Salt Lake City and made available on the Internet through [Mesowest](#). Once an Event Reporting Criteria is triggered, the authorities can follow a pre-arranged plan of operations that should include sending patrols to Oak Creek Campground and alerting local city officials and irrigation companies. The National Weather service is willing to issue storm alerts based on monitoring with Doppler radar provided coverage is available. The Doppler radar would provide additional advanced warning.

Objective

1. Protect human life and property by giving first responders advanced notice of potential flood and debris flow events
2. Allow irrigation companies time to close vulnerable head gates so that canals do not fill in with ash and to assure that diversions are managed to reduce rather than increase flood potential in Oak City and Fool Creek.

- *Temporary Fencing*

Method

A two-wire electric fence will be installed to prevent livestock from adjoining unburned pastures from entering the burned area. This fence is needed to protect emergency BAER land treatments.

Objective

Protect BAER stabilization treatments and natural recovery.

- *Protection and Safety Signing*

Method

Forest Road 089, which is the major entry point onto National Forest System lands in the area, will be signed to provide warning and direction to users in the burned area. Example wording for the sign: "CAUTION – Areas within and downstream of Burned Areas are subject to Extreme Flooding and other Hazards including falling rocks and trees." and "ATTENTION – Please help these burned areas recover. Drive only on open designated roads and trails." Signs are also needed to make it obvious that dozer lines are closed to motorized travel.

Objective

1. Reduce the likelihood that post-fire floods and falling rocks and debris will harm forest users.
2. Protect BAER emergency land treatments.
3. Promote natural post-fire recovery.

- *Flood Hazard Signing*

Method

Forest Road 089, which is the major entry point onto National Forest System lands, will be signed to provide warning and direction to users in the burned area. The signs will be located on road 089 below the mouth of Devil's Den and above Limekiln Canyon. Wording on the sign will be "Flash Flood Area" and "No Parking Next 1 Mile".

Objective

1. Reduce public exposure to the areas likely to be affected by post-fire floods.

- *Temporary Gate Closures*

Method

The roads up Devil's Den and Limekiln Canyon will be closed to the public for 1 to 2 years to reduce the risk to human life and property. The roads will be blocked as they leave Forest Road 089. The gates will be signed to explain the reason for the closures, which in this case is public safety by keeping them away from areas that are now prone to flooding.

Objective

1. Reduce public exposure to the areas likely to be affected by post-fire floods.

- *Storage Tank Protection*

Method

Roughly 30 to 40 feet of Jersey barrier will be placed in a V-shape to deflect water and debris around the culinary storage tank for the Oak Creek campground. The tank is located on an accessible portion of the Limekiln alluvial fan and is at risk from flooding and debris flows.

Objective

1. Protect culinary water quality and the tank infrastructure that supports it.

**I. Monitoring Narrative:**

(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Noxious Weed Monitoring

The purpose of this monitoring is to determine if noxious weed populations have expanded into the fire from existing populations, along access routes, and from dozer lines. Noxious plants generally will be treated at the same point in time they are discovered. Monitoring of treatments and weed expansion beyond Year 1 will occur using Key Point 2 or appropriated funding sources.

Monitor Seeding and Mulching Effectiveness

The results from the aerial seeding and mulching towards establishing effective ground cover and preventing erosion will be evaluated in Year 1. Effective ground cover will be assessed with regards to whether or not potential for erosion and runoff is reduced in the first year, and whether or not the treatments helped reduce or prevent expansion of noxious weeds and cheatgrass.

Soil Erosion and Storm Flow Monitoring

Post storm event monitoring will visually assess the movement of soil and water off the mountain and into the valley below. Two storms in the first year will be monitored. Data collected by a tipping rain bucket will be used to determine the size and duration of storm events. Peak flows from post-fire storms will be estimated where possible. Debris fences will be inspected if an event occurs to see if they functioned as intended.

Protection Treatments

Inspections will determine if the weather station, fencing, gates, and signage have achieved their intended purposes and if the structures are still in working condition.

Monitoring Report and Interim Requests

A Year 1 monitoring report will be submitted to the RO even if an interim BAER request is not submitted. A detailed monitoring report is attached to the specialist reports.

**Part VI – Emergency Stabilization Treatments and Source of Funds****Interim #**

<b>A. Land Treatments</b>										
Aerial Seeding	acres	\$78.50	988	77,558.00	\$0	\$0	\$0	\$0	77,558.00	
Aerial Mulching	acres	\$865.00	251	217,115.00	\$0	\$0	\$0	\$0	217,115.00	
Noxious Weed Monitor	acres	\$4.00	625	2,500.00	\$0	\$0	\$0	\$0	2,500.00	
Herbicide Application	acres	\$80.00	311	24,880.00	\$0	\$0	\$0	\$0	24,880.00	
				0.00	\$0	\$0	\$0	\$0	0.00	
				0.00	\$0	\$0	\$0	\$0	0.00	
				0.00	\$0	\$0	\$0	\$0	0.00	
Subtotal Land Treatments				322,053.00	\$0	\$0	\$0	\$0	322,053.00	
<b>B. Channel Treatments</b>										
Debris Fence	feet	\$4.75	1200	5,700.00	\$0	\$0	\$0	\$0	5,700.00	
				0.00	\$0	\$0	\$0	\$0	0.00	
				0.00	\$0	\$0	\$0	\$0	0.00	
				0.00	\$0	\$0	\$0	\$0	0.00	
Subtotal Channel Treat.				5,700.00	\$0	\$0	\$0	\$0	5,700.00	
<b>C. Road and Trails</b>										
Standard Graded Dips	each	\$50.00	145	7,250.00	\$0	\$0	\$0	\$0	7,250.00	
Armored Graded Dips	each	\$2,175.00	4	8,700.00	\$0	\$0	\$0	\$0	8,700.00	
				0.00	\$0	\$0	\$0	\$0	0.00	
				0.00	\$0	\$0	\$0	\$0	0.00	
Subtotal Road & Trails				15,950.00	\$0	\$0	\$0	\$0	15,950.00	
<b>D. Protection/Safety</b>										
Early Warning Weather	each	\$8,500.00	1	8,500.00	\$0	\$0	\$0	\$0	8,500.00	
Temporary Fencing	miles	\$2,500.00	3.5	8,750.00	\$0	\$0	\$0	\$0	8,750.00	
Protection Signing	each	\$400.00	1	400.00	\$0	\$0	\$0	\$0	400.00	
ATV Signing	each	\$50.00	5	250.00	\$0	\$0	\$0	\$0	250.00	
Flood Hazard Signing	each	\$400.00	3	1,200.00	\$0	\$0	\$0	\$0	1,200.00	
Temporary Gate	each	\$1,850.00	2	3,700.00		\$0	\$0	\$0	3,700.00	
Storage Tank Protection	each	\$2,400.00	1	2,400.00	\$0	\$0	\$0	\$0	2,400.00	
Subtotal Structures				25,200.00	\$0	\$0	\$0	\$0	25,200.00	
<b>E. BAER Evaluation</b>										
BAER Team	each	\$23,800.00	1	---	23800					
Supplies & Documents	each	\$500.00	1	---	500					
BARC Image	each	\$580.00	1	---	580					
				---		\$0	\$0	\$0	0.00	
				---	\$0	\$0	\$0	\$0	0.00	
Subtotal Evaluation				---	\$24,880	\$0	\$0	\$0	24,880.00	
<b>F. Monitoring</b>										
Year 1 + Report	each	\$10,400.00	1	10,400.00	\$0	\$0	\$0	\$0	10,400.00	
Cultural Resource Survey	acres	\$25.00	12	300.00	\$0	\$0	\$0	\$0	300.00	
Subtotal Monitoring				10,700.00	\$0	\$0	\$0	\$0	10,700.00	
<b>G. Totals</b>										
				379,603.00	\$24,880	\$0	\$0	\$0	404,483.00	
Previously approved				13,600.00						
Total for this request				366,003.00						

**PART VII - APPROVALS**

1. /s/Mary C. Erickson  
MARY C. ERICKSON  
Forest Supervisor (signature)

09/05/2006  
Date

2. /s/ Mary Wagner for  
JACK G. TROYER  
Regional Forester (signature)

09/08/2006  
Date