

Date of Report: 09/15/1999

BURNED-AREA REPORT

(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

- 1. Funding Request for Estimated WFSU-FW22 Funds
- 2. Accomplishment Report
- 3. No Treatment Recommendation

B. Type of Action

- 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)
- 2. Interim Report
 - Updating the initial funding request based on more accurate site data and design analysis
 - Status of accomplishments to date
- 3. Final report-following completion of work

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: High Complex B. Fire Number: P56440

C. State: California D. County: Shasta

E. Region: 5 F. Forest: Shasta-Trinity National Forests

G. District: Shasta-McCloud Management Unit

H. Date Fire Started: 8/23/1999 I. Date Fire Controlled: 9 / / 1999

J. Suppression Cost: est. [REDACTED]

K. Fire Suppression Damages Repaired with WFSU-PF12 Funds:

1. Fireline waterbarred (miles) 81 Safety Zones treated (ac) 10
 2. Fireline seeded (miles) 30.2 Roadsides mulched (mi) 12.8
 3. Fireline 51.3 Fireline slashed (miles) 57.4
 mulched (miles) _____

L. Watershed Number: 1802000503 and 1802000504

M. NFS Acres Burned: 27,775 Total Acres Burned: 38,086

() State (91) BLM (10,220) PVT () _____

N. Vegetation Types: Live Oak, Douglas Fir, Ponderosa Pine, Black Oak,
Mixed Conifer, Chaparral

O. Dominant Soils: Marpa, Goulding, Etsel, Chawanakee, Holland, Deadwood,
Neuns Families; Rock outcrop, Rock outcrop (sedimentary)

P. Geologic Types: Metavolcanics, metasediments, limestone, ultramafic
intrusives, basic intrusives, granitic intrusives

Q. Miles of Stream Channels by Type: Perennial = 56 miles, Intermittent = 90 miles, Ephemeral = 201 miles

R. Transportation System:

Trails: 7 miles Roads: 101* miles

*Most of these roads are on the perimeter of the fire.

PART III - WATERSHED CONDITION

A. Fire Intensity (acres): 28,222 (low) 4,189 (moderate) 5.675 (high)

B. Water-Repellent Soil (acres): 7769

C. Soil Erosion Hazard Rating (acres): 2,700 (low) 23,200 (moderate) 11,927 (high)

D. Erosion Potential: 3.93 tons/acre

E. Sediment Potential: 2037 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period: 10 years

- B. Design Chance of Success: 80 percent
- C. Equivalent Design Recurrence Interval: 10 years
- D. Design Storm Duration: 24 hours
- E. Design Storm Magnitude: 9.33* inches
- F. Design Flow: 168 cubic feet per second per square mile
- G. Estimated Reduction in Infiltration: 5 percent
- H. Adjusted Design Flow: 176 cubic feet per second per square mile

* Although this figure appears to be very high, it has been calculated correctly for this area and verified with the IC meteorologist. The Sacramento River canyon acts as a funnel for convection storms and produces high rainfall events.

PART V - SUMMARY OF ANALYSIS

- A. Describe Watershed Emergency:
See attached statement at end of document
- B. Emergency Treatment Objectives:

See attached statement at end of document.
- C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:

Land 95 % Channel 90 % Roads 90 % Other _____ %

- D. Probability of Treatment Success

	<----Years after treatment---->		
	1	3	5
Land	80	90	95
Channel	80	90	90
Roads	95	100	100
Other			

- E. Cost of No Action (Including Loss): ██████████ _____
- F. Cost of Selected Alternative (Including Loss): ██████████ _____

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input checked="" type="checkbox"/> Geology	<input type="checkbox"/> Range
<input checked="" 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 type="checkbox"/> Research	<input checked="" type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Fisheries			

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H. Treatment Narrative:

The following are the proposed emergency treatments for the High Fire Complex. All of these treatments will serve to meet BAER objectives and have been determined to be effective for their purpose when used under similar conditions in other wildfire areas. The final set of treatments was determined with the input of the BAER survey team, the responsible Line Officers, the USDA Natural Resource Conservation Service, the California Department of Forest and Fire Protection, and the California Department of Fish and Game.

Land Treatments:

Aerial Seeding

Application of cereal grain grass seed by helicopter is prescribed for 248 acres of high burn intensity lands in the Charlie Creek drainage. The grass is needed to provide a protective ground cover, reduce runoff efficiency from the burned slopes, reduce erosion and offsite sedimentation, and retain the soil on site for long term soil productivity. The dried seed application proposed consists of 100 pounds per acre of cereal barley. The cereal barley is needed for good erosion control during the first winter rains. The barley will not persist beyond the first two years. Native seed was considered for these areas and was determined to be too expensive to be applied at the rates necessary for reasonable erosion control. Cereal barley is estimated to cost [REDACTED] for the seed needed to treat one acre, whereas a mix of the lowest priced native seed would cost [REDACTED] acre.

Straw Wattles

Straw wattles are used as another means of preventing soil from moving off of a slope and into the stream system. Placed along the contour on moderate slopes or in shallow swales the wattles have proved effective in trapping small amounts of eroded material to keep it on site. On high burn intensity areas with hydrophobic soil conditions the wattles serve to slow down sheeting water during moderate to high intensity rainfall events. The wattles will be placed in a checkerboard pattern to reduce the potential for concentration of water. 875 lineal feet of wattles will be used in the

Charlie Creek watershed to prevent erosion on high intensity burned areas and near the water diversion site for the domestic water supply.

Strip Mulching

Strip mulching with certified weed-free straw is proposed for 40 acres in the Charlie Creek watershed and 133 acres in the Reptile Fire area. The purpose of the treatment is to provide a suitable ground cover where there presently is none. The extent of this treatment is further confined to sensitive areas near stream channels or highly erodible soils in high value watersheds. Mulching in strips, across slopes has proven to be a more cost effective method of applying this treatment. Strip widths of 15 feet alternate between mulched and unmulched area.

Channel Treatments:

Straw Bale Check Dams

The purpose of a straw bale check dam is to temporarily capture sediment in the upper reaches of ephemeral or intermittent stream channels. Wood or rock is used to dissipate the overflow of water on the downstream side of each dam and to provide a longer term storage capacity once the straw bale has decomposed. Straw dams have been proven effective in similar burned areas in their ability to capture sediment in the first two years after the fire and then allow the sediment to be metered out at a lower rate in subsequent years. There are 22 straw bale check dams prescribed for the Charlie Creek watershed and 25 dams for the Reptile Fire area.

Rock or Log Grade Control Structures

Another channel treatment deemed necessary for the BAER effort in this fire area is the use of native materials to reestablish stream bed stability in the small channels that were burned intensely in the fire. Depending on availability of local materials either rocks or small diameter logs are used to establish a nick point, or grade control in the small channels. These structures are designed to provide for channel bed stability, not collection and storage of sediment. In the Charlie Creek watershed 19 of these structures will be needed. The Reptile Fire area will require the use of 50 of these structures.

Vegetation Planting

Riparian Reserve Planting

The Reptile Fire burned in a Late Successional Reserve. Burn intensities were high in a portion of the Riparian Reserves within the fire boundary, killing all vegetation. Replanting these areas with a mix of riparian and upland tree and shrub species is necessary to minimize the possibility of an unacceptable change to the ecosystem structure and function. Twenty-five acres of planting has been identified within the boundaries of the riparian reserves within the Reptile Fire area. A mixture of dogwood, big leaf maple, Douglas fir, ponderosa pine, redbud and and/or deer brush will be used depending on availability. If no ecologically acceptable plants are available local plants will be propagated from cuttings or seeds this fall for planting next year. A Forest Service greenhouse is available in Mt. Shasta to do the propagation.

Road Treatments

Culvert Treatments and Fill Protection

The High Fire burned the south facing flanks of Green Mountain, in the headwaters of Middle Salt Creek. The southern fireline of the fire was the Fender's Ferry road (34N17), an important connecting road across this portion of the Shasta-McCloud Management Unit. Burn intensities were high on the ridges where most of the shrubby vegetation was burned to the ground. There is a reasonable risk of culvert plugging and fill failure due to the effects of the fire, the hydrophobic nature of the soils and the high rainfall intensity expected for this area. The treatments proposed are designed to address this risk at a reasonable cost. Twenty-one culvert inlets will be cleaned and fire related debris will be cleaned from the channels 100 feet upstream from the inlets. In addition "critical dips" will be graded into the road below each of the culvert sites to ensure that any runoff from a plugged culvert is not routed down the road.

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

Line Items	Units	Unit Cost \$	NFS Lands			Other Lands			All Total \$
			Number of Units	WFSU- FW22 \$	Other \$	Number of Units	Fed \$	Non- Fed \$	
					ident.		ident.	ident.	

A. LAND TREATMENTS

Straw wattles	lineal ft.	█	875	█					
Strip Mulching	acres	█	173	█					
Aerial Seeding	acres	█	248	█					

B. CHANNEL TREATMENTS

Straw Check Dams	each	█	47	█					
Rock Grade Stablzr	each	█	24	█					
Log Grade Stablzr	each	█	45	█					

C. ROADS AND TRAILS

Flood patrol	days	█	10	█					
Culvert trtmt and dips	each	█	21	█					

D. VEGETATION PLANTING

Riprn Reserve Plntg	acres	█	25	█					

E. BAER EVALUATION/ADMINISTRATIVE SUPPORT

Salary, Travel, Etc.	days	█	11	█					
Color IR photo coverage	acres	█	38,086	█					

F. MONITORING

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Sixty percent of the South Fork Slate Creek watershed was burned by the Reptile Fire. Located near the mouth of South Fork Slate Creek is a diversion structure and fish ladder for the Slate Creek small hydroelectric power facility. This facility is susceptible to damage or destruction from increased peak flows resulting from the wildfire effects. The access road to this structure along with the diversion pipeline is also subject to damage from increased peak flows or debris flows resulting from the effects of the fire. Total value of the facility subject to destruction is [REDACTED]

3. Loss of Control of Water: Major loss of control of water is not expected in any of the large streams in the burned area. The mosaic nature of high, moderate and low burn intensities should have only a small effect on the peak flows of Backbone Creek, Sugarloaf Creek, Dog Creek, Slate Creek, Middle Salt Creek, South Salt Creek and the Sacramento River. Smaller tributaries to these channels and others are more likely to experience increased peak flows due to effects of the fire, however, because the proportion of the watersheds burned intensely is high. Particular tributaries include unnamed streams in the High Fire, Dog Fire and the Charlie Creek watershed. Plugging of culverts is one threat posed by increased peak flows, resulting in the loss of fill slopes, increased stream sedimentation with the loss of fish habitat and degraded water quality. An archeological site, a flume dating from the early 1900s, had run from the Lamoine mill site to the old town site of Lamoine. Ruminants of the flume are still located along the South Fork Slate Creek, within the boundary of the Reptile fire. This site would be affected by an increased flooding event or debris flow resulting from the effects of the fire.

4. Threats to Water Quality: All of the burned area drains directly or indirectly into Shasta Lake. A loss of water quality is likely from increased sedimentation, turbidity, floating debris and nutrient enrichment. Recreational use of water will be affected by these water quality impacts in the Sacramento Arm of the lake. Backbone Creek and Dog Creek are identified in the Shasta-Trinity NF Aquatic Strategy as being Focal watersheds, i.e. of high value for inland fish habitat. In addition Sugarloaf Creek and Slate Creek were also identified by the California State Department of Fish and Game as being of high value for fish production. All of these streams would suffer a loss of fish habitat with increased sedimentation and a degradation of water quality. Fishing and rafting would also be affected in the lower reaches of the Sacramento River. Water temperatures are not likely to be affected because the fires generally did not kill shade producing vegetation along perennial streams. Other beneficial uses of water in the burned area include: Domestic use, campground potable water, hydroelectric power production and habitat for American Bald Eagle and Osprey. The domestic water supply from Charlie Creek uses an average of 112,500 gallons of water per day. The value of the intake and pipeline subject to destruction is [REDACTED]. The value of supplying an emergency supply of water in case the facility is destroyed has been estimated by the local watermaster as [REDACTED].

5. Threats to Long Term Soil Productivity: Much of the burned area had a low site productivity before the fire. The Backbone and Sugarloaf watersheds in particular have been broadly affected in the past by vegetative denuding and subsequent erosion resulting from the effects of copper smelting in the area for several decades following the turn of the century. The south facing slopes of Green Mountain, in the High Fire, consist of steep shallow shale soils which are naturally low in soil productivity. Highly productive soils exist in the Reptile Fire area and on the more gentle terrain scattered throughout the remainder of the fire area. For this analysis only the higher site classes for soil productivity were looked at. Loss in soil productivity was assumed to occur on high intensity burned areas. By equating high intensity fire to a loss of one site class the value of the loss of soil productivity can then be quantified as a loss in timber production values. Timber production values before and after the fire were then used to determine the value of the loss of soil productivity across the fire area as a result of the wildfire. The calculated loss of soil productivity is [REDACTED].

B. Emergency Treatment Objectives:

The two alternatives presented in this request have separate objectives. Alternative 2 represents a BAER program designed to address the threat to the major values at risk in the High Complex burned area. The areas of focus are the Charlie Creek watershed, a domestic water supply watershed, and the Reptile Fire area which contains a hydroelectric power withdrawal site. The objectives are to reduce impacts to water quality, minimize sedimentation and retain ecological diversity. The objectives for Alternative 3 are to address the threat to the remaining values at risk in the other watersheds in the fire area. These values are the road crossings on the Fender's Ferry road below the High Fire area, and the water quality issues in the Sugarloaf and Backbone Creek watersheds.

MONITORING PLAN

Objectives: The objective of the monitoring needs identified for the High Complex BAER implementation project are to evaluate the effectiveness of the BAER treatments prescribed and implemented. The implementation of the BAER work will be efficiently monitored through the BAER reporting process. The final BAER report will provide details of implementation for each of the treatments.

Methods: For each of the treatments applied a photo point monitoring system will be established at selected sites to photo identify conditions prior to treatment, after treatment and each year afterward for three years. For erosion prevention treatments selected sites will be measured for ground cover and evidence of soil erosion. The methodology established for the Region 5 Best Management Practice Evaluation Program will be used. For erosion control treatments a selected number of structures will be evaluated for function and effectiveness to control eroded material.

Two people will be funded for two pay periods each for the three years of monitoring. These people will be involved from before BAER implementation through the entire monitoring period. The time funded will include time for gathering field data, analysis of the data, interpretations, recommendations and reporting. Supply and instrumentation needs will be limited.

Reporting: Interim results will be reported to the Forest Supervisor annually, with a final report due after the third year of monitoring. If a major storm (50 year, plus) occurs at any time during the three year monitoring period an interim report will also be produced to report the effects on the BAER work.

A more complete monitoring plan will be prepared prior to implementation of the BAER work.

THE BAER TEAM

The High Complex fires began from multiple lightening strikes on August 23, 1999. Darrel Ranken, forest hydrologist, was designated as BAER team leader and began working with the Incident Command Type I Team on August 26th. By August 30th a Suppression Rehab team had been formed to assess fire suppression rehabilitation needs and accomplishments. On September 9th the actual BAER survey commenced in full. The following people were involved in some capacity on either the Suppression Rehab team, BAER team or both.

Suppression Rehab Team: Joe Zustak (team leader), Jackie Knight, Gaylon Wilcox, Rich Teixeira, Jim DeMaagd, Renay Zmak, Tim Gillentine, Allen McAlexander, and Ron Toroni.

BAER Team: Darrel Ranken (team leader), Annetta Mankins, Deby Selby, Julie Nelson, Pat Kennedy, Julie Cassidy, Tom Carter, Jerry Harmon, Peter Van Susteren, Steve Bachmann, Jeff Paulo, and Tom Laurent. Linda Marianito was the BAER team representative from the Natural Resource Conservation District.

Revised Monitoring Plan (July 2000)

Native vegetation recovery—persistence of seeded cereal barley

- a) **Treatment:** Aerial seeding of 446 acres of moderate to high intensity burn areas within the Charlie Creek watershed was carried out in October of 1999. Cereal barley was seeded at a rate of 100 lb./acre
- b) **Management concerns:** Controversy exists over the persistence and long-term effect of cereal grains used for erosion control on National Forest lands. Do annual cereal grains used for treatment of burned areas reseed and persist on the landscape beyond the span of time when they are useful for erosion control?
- c) **Objectives:** To observe and record the persistence of cereal barley in the seeded area.
- d) **Locations:** Representative sites in the Charlie Creek watershed.
- e) **Frequency & Duration:** Monitor annually during the barley flowering/fruiting season for five years or until barley disappears, whichever comes first.
- f) **Monitoring Design & Methodology:** Choose 5-6 sites within the Charlie Creek watershed that were seeded with barley. For each site, establish a photo point. From this point, throw a ring in each of 4 directions and where it lands, record the # of barley stems within the perimeter.
- g) **Reporting:** Annual reporting of summary results will be provided to the Shasta-Trinity Forest Supervisor. At the end of the monitoring period, a final report will be submitted to the Regional Office and the Shasta-Trinity Forest Supervisor. The final report will show the trend in barley persistence & density in the Charlie Creek watershed, and will interpret these results to apply to future cereal seeding policy.
- h) **Cost:** GS-11 Botanist 5 days/yr X 5 yr. [redacted] day
Vehicle [redacted]/yr X 5 yr [redacted]
Total [redacted]
- i) **Personnel:** Forest Botanist and/or District Botanist
- j) **Responsible Official:** Forest Supervisor
- k) **Follow-up Actions:** Adjust BAER seeding policy if needed.

Native vegetation recovery—effect of BAER-related weed establishment

- a) **Treatment:** All structural and non-structural treatments in the High Complex fire area.
- b) **Management concerns:** Materials, equipment, and personnel used in BAER reconnaissance and treatment are potential vectors for movement of invasive plants into the burn area. Are there new or expanded weed infestations inside the High Complex perimeter that are related to the BAER effort?
- c) **Objectives:** Identify weed infestations within the burn area and correlate these with BAER activities.
- d) **Locations:** Areas treated in the High Complex, and areas within the burn perimeter that were traversed

by vehicles or equipment on the way to treated areas.

e) **Frequency & Duration:** Annually for five years or until BAER-affected areas of the burn are found to be weed free.

f) **Monitoring Design & Methodology:** Using BAER records, determine which areas of the High Complex were traversed and/or treated. Perform ground reconnaissance of these areas to search for exotic invasive plants. Determine which of the weed infestations, if any, is related to the BAER effort using the evidence available. Map weed locations and add to Forest GIS weed coverage.

g) **Reporting:** Weed infestations located during the monitoring will be reported to the appropriate District Rangers and Forest Supervisor. A final report at the end of the monitoring period will be submitted to the District Rangers, Forest Supervisor, and Regional Office.

l) h) Cost:	GS-11 Botanist	5 days/yr X 5 yr.	█/day	█
	Vehicle	█/yr X 5 yr		█
			Total	█

i) **Personnel:** Forest Botanist and/or District Botanist

j) **Responsible Official:** Forest Supervisor

k) **Follow-up Actions:** Eradicate or contain weed infestations located during monitoring.

Total monitoring authorization request: █