

Date of Report: 03/04/2003

BURNED-AREA REPORT
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST**

A. Type of Report

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

B. Type of Action

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

PART II - BURNED-AREA DESCRIPTIONA. Fire Name: BullockB. Fire Number: P33962C. State: ArizonaD. County: PimaE. Region: 03F. Forest: CoronadoG. District: Santa CatalinaH. Date Fire Started: 05/21/2002I. Date Fire Controlled: Contained 06/11/2002J. Suppression Cost: \$14,356,000

K. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): 49
2. Fireline seeded (miles):
3. Other (identify): pulled slash back onto firelines

L. Watershed Number: 1505020303 (San Pedro River-Kielberg), 1505020302 (San Pedro River-Redfield), 1505030203 (Rillito Creek)M. Total Acres Burned: 30,563

NFS Acres(29,449) Other Federal () State () Private (1114)

N. Vegetation Types: Coniferous forest (mixed conifer), coniferous forest (transition), coniferous woodland, broadleaf woodland (evergreen), Southwest desertscrub, chaparral, deciduous riparianO. Dominant Soils: Lithic Ustochrepts, Typic Ustochrepts

P. Geologic Types: Granite, sedimentary

Q. Miles of Stream Channels by Order or Class:

- 139 miles of 1st and 2nd order channels
- 8 miles of 3rd order channels (Buehman, Edgar and Alder Canyons)

R. Transportation System

Trails: 40 miles Roads: 20 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 20,231 (low) 4,205 (moderate) 6,112 (high)

B. Water-Repellent Soil (acres): 8,200

C. Soil Erosion Hazard Rating (acres):
1,329 (low) 2,090 (moderate) 27,144 (high)

D. Erosion Potential: 38 tons/acre (2 years)

E. Sediment Potential: 473 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 3-10 years, based on previous fires in similar areas.

B. Design Chance of Success, (percent): 80%

C. Equivalent Design Recurrence Interval, (years): 2 yrs

D. Design Storm Duration, (hours): 24 hours

E. Design Storm Magnitude, (inches): 2.2 inches

F. Design Flow, (cubic feet / second/ square mile): 90 cfs/square mile (Hydrology Note 14)

G. Estimated Reduction in Infiltration, (percent): 55%

H. Adjusted Design Flow, (cfs per square mile): 140 cfs/square mile (Hydrology Note 14)

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

Based on the BAER Team field survey and analysis the following emergencies exist on federal lands:

Threat to life and federal property

- Approximately 6.2 miles of road (the Control Road) are directly at risk of being destroyed by increased intensity runoff, debris flows, and rock falls from severely burned areas upslope and downslope of the road. Portions of the watershed above and below this road are severely burned. This road is critical for emergency access and egress to the year-round community of Summerhaven, and has been identified

as the emergency evacuation route for Summerhaven by the Pima County Sheriff and the Mt. Lemmon Fire District. The main route to the community (General Hitchcock Highway) has been closed twice in the last 14 years by flood events. On these occasions, the Control road was the only route to and from Summerhaven. Since the watersheds above the General Hitchcock Highway were also affected by the Bullock Fire, the probability of road closure has increased. The Oracle Control road was engineered early in the 20th century. Because of the complex terrain and geological features, if significant portions of the road are destroyed, road reconstruction will be extremely expensive.

- The steep terrain adjacent to the developed picnic grounds near Loma Linda was severely burned. Easy access by the public to this fragile land puts it at risk to delayed revegetation.
- The disposal field for the Pima County Wastewater treatment facility in Summerhaven was burned over.
- The Willow Canyon summerhome community has only one access road, approximately 3.2 miles. Failure of road crossings would isolate 68 cabins from emergency access or egress.
- The Rose Canyon Campground has facilities that could be damaged by high water or accelerated erosion valued at \$306,000. In addition, the road to Rose Canyon Campground has a road crossing that at risk of being washed out by high water. The cost to replace it is \$80,000.
- General Hitchcock Campground has facilities valued at \$30,000 that could be damaged by high water or accelerated erosion.
- Chihuahua Pine, Middle Bear, and Cypress Picnic Areas have facilities valued at \$229,000 that is at risk of damage by high water or accelerated erosion.
- Several Summer Homes are on the edge of a severely burned area. Easy access by the public to this area will delay revegetation. In addition, the channel of a severely burned small watershed passes right behind one of the homes. While not an immediate threat to damage the structure, alterations in this channel due to increased flows could make the slope behind the house steeper and more dangerous.
- There are 40 miles of trails in the burned area. The following 21 miles of trails are at risk of being lost due to accelerated erosion:
 - Crystal Spring – 2.6 miles valued at \$52,000
 - Butterfly – 5.2 miles valued at \$104,000
 - Bigelow – 0.5 miles valued at \$10,000
 - Kellogg – 0.6 miles valued at \$12,000
 - Knagge – 3.0 miles valued at \$60,000
 - Davis Springs – 2.0 miles valued at \$40,000
 - Brush Corral – 2.0 miles valued at \$40,000
 - Shortcut – 0.6 miles valued at \$12,000
 - Green Mountain – 3.6 miles valued at \$72,000
 - Maverick Spring – 0.4 miles valued at \$8,000
 - Oracle Ridge – 0.5 miles valued at \$10,000
- The Mt. Lemmon Highway, an award winning National Scenic Byway, is valued at over \$1,000,000 per mile. It is the primary access to the community of Summerhaven and the preferred evacuation route for residents. It is at risk of damage at several locations due to accelerated erosion that could plug culverts and increased flows from burned watersheds.
- Sollers Road is the access road to a helispot and residence and is valued at \$60,000. It is at risk of damage due to accelerated erosion that could plug culverts and increased flows from burned watersheds.
- Redington Road is the access route from San Manuel to Redington on the east side of the Catalinas. Three major washes, Alder, Edgar, and Buehman, originate in the burned area and threaten the road where they cross. The Redington Road costs \$1,000 per mile to repair after damage.
- Alder, Edgar, and Buehman Canyons have values as rangelands, wildlife habitat, backcountry recreation (hiking and hunting), and riparian areas. In addition, there are irrigated farmlands and residences adjacent to the channels on private land near the San Pedro River.

B. Emergency Treatment Objectives:

The objectives of the proposed treatments are to:

- Reduce the impacts of high intensity runoff, debris flows and rock falls to the Mt. Lemmon Highway, Oracle Control Road, Sollers Road, Rose Canyon Road and the Willow Canyon summerhome access road.
- Reduce the impacts of high intensity runoff, debris flows, and rock falls to the Rose Canyon Campground, General Hitchcock Campground, Chihuahua Pine Picnic Ground, Middle Bear Picnic Area, and Cypress Picnic Area.
- Reduce potential for accelerated erosion at the Pima County Wastewater treatment facility disposal field.
- Reduce the impacts of high intensity runoff and accelerated erosion on the Crystal Springs, Butterfly, Bigelow, Kellogg, Knagge, Davis Springs, Brush Corral, Shortcut, Green Mountain, Maverick Spring, and Oracle Ridge trails.
- Promote rapid revegetation of the steep, severely burned area adjacent to the Summer Home Area and Loma Linda Picnic Grounds
- Minimize impacts to downstream landowners from increased runoff and accelerated erosion
- Minimize impacts to rangeland, wildlife habitat, and riparian resources

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

Land 80 % Channel % Roads 85 % Other %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	40	70	85
Channel			
Roads	80	95	100
Other			

E. Cost of No-Action (Including Loss): Cost of no action is \$7,500,000 (value of infrastructure) + \$21,776,500 (value of soil loss)= \$29,276,500

F. Cost of Selected Alternative (Including Loss) :\$948,785 + \$1,125,000 (15% of total value lost even if treated) + \$21,289,800 (soil loss) total \$23,363,585

G. Skills Represented on Burned-Area Survey Team:

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

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H. Treatment Narrative:

Land Treatments:

Aerial Seeding COMPLETED: Apply seed by fixed-wing aircraft or helicopter to 6000 acres in Bear, Alder, Edgar, and Buehman Canyon watersheds paying particular attention to the Barnum Rock, Green Spring Watershed, Slide Area, Sollers, Summer Home, Kellogg, and Incinerator Ridge areas. Do not seed the Butterfly Research Natural Area. Where mulch is also prescribed (see below) seed before mulch is applied before summer monsoon season. For larger areas, where no mulch is applied, seed after soil is moistened or on snow. The seed mix for areas below 6,000 feet is:

Sideoats grama (<i>Bouteloua curtipendula</i>)	3.0 lbs/acre
Sand dropseed (<i>Sporobolus cryptandrus</i>)	1.0 lb/acre
Arizona fescue (<i>Festuca arizonica</i>)	1.0 lbs/acre
Barley (<i>Hordeum vulgare</i>)	4.0 lbs/acre

The seed mix for areas above 6,000 feet is:

Arizona fescue (<i>Festuca arizonica</i>)	1.5 lbs/acre
Slender wheatgrass (<i>Agropyron trachucaulum</i>)	5.0 lbs/acre
Annual ryegrass (<i>Loium multiflorum</i>)	4.0 lbs/acre
Barley (<i>Hordeum vulgare</i>)	4.0 lbs/acre

Ground seeding COMPLETED 18 acres in the Pima County Wastewater Disposal Field, the Summer Home area, and Loma Linda Picnic Ground will be applied by hand. The seed mixes are the same as described above.

Mulch COMPLETED 56 ACRES. THE FOREST ELECTED NOT TO MULCH THE REMAINING 371 ACRES FOR THE FOLLOWING REASONS: THERE WAS TOO MUCH HEAT IN THE AREA TO BE MULCHED (SOME MULCH WAS CATCHING FIRE DUE TO BURNING ROOTS BENEATH THE GROUND); IT WOULD NOT BE SAFE TO MULCH UNTIL AFTER SIGNIFICANT RAIN; AFTER SIGNIFICANT RAIN THE GREATEST BENEFIT OF THE MULCH TO PROTECT SEED FROM BEING WASHED OFF WOULD BE LOST: 427 acres will be mulched with wood chips or weed free wheat or rice straw. Mulch is used to cover soil, reducing raindrop impact and soil erosion. It will be applied at a rate of 1 ton per acre (approximately 25 straw bales). It will be applied by air where inaccessible. It is used in conjunction with grass seeding.

Hazard Tree Removal: COMPLETED APPROXIMATELY 12 ACRES OF HAZARD TREES REMOVED TO ASSURE SAFETY FOR RECREATION IN THE LOMA LINDA AREA. Removal of hazard trees along the Mt. Lemmon Highway and Oracle Control Road is scheduled for this winter and spring as weather permits. Removal of hazard trees along all trails within the fire is proposed for completion this summer with National Fire Plan funds.

Hydromulch COMPLETED 23 ACRES: Apply hydromulch with seed and fertilizer along 16 miles of the Mt. Lemmon Highway and Oracle Control Road.

Early Warning System COMPLETED Pima County has equipment that can be installed on Green Mountain to become part of the County Early Warning System. It could be used to predict events in either the Bear Canyon (Tucson) area or the San Pedro (Redington) area.

Fences COMPLETED: A fence will be built along the Loma Linda interface with the severely burned area to keep people off the revegetating slope.

Channel Treatments:

Channel Debris Cleaning COMPLETED: Channel debris will be removed from channels in the Barnum Rock, General Hitchcock, and Sollers areas. A watershed specialist will identify debris to be removed from channels and direct where it should be placed. Approximately 3 miles of channels will be treated.

Trash Racks COMPLETED Trash racks of appropriate size will be installed in channels in the Barnum Rock, General Hitchcock, and Sollers areas along the Mt. Lemmon Highway.

Diversions: Jersey barriers will be used to create a diversion along the Mt. Lemmon Highway in the Barnum Rock area to direct overflow to other culverts instead of across the road and fill if necessary.

Roads and Trail Treatments:

Control Road COMPLETED: Remove top 3 feet of roadway in 11 critical areas. Use material to build large water bar down grade of each site. Line outside edge of road with jersey barrier and backfill road up to top of the jersey barriers with 2 ft. riprap. Cover riprap with filtercloth and 6 inches of native road material.

Willow Canyon Road CANCELLED – THIS CROSSING IS UNCHANGED AFTER SEVERAL PRECIPITATION EVENTS: Remove native material in ford crossings to 3 ft. deep or until large material is encountered at each of 2 stream crossings. Set jersey barriers to control level of channel bottom along downstream edge of crossing. Backfill with 2 ft. riprap and cover with filter fabric and native material for driving surface.

Rose Canyon Road CANCELLED – THIS CROSSING IS UNCHANGED AFTER SEVERAL PRECIPITATION EVENTS: Remove the existing pair of culverts and replace with a concrete, hardened low water crossing. Modify roadway profile below crossing to keep flow in the channel crossing.

Trails COMPLETED 21 MILES: Remove hazard trees, construct larger and more frequent drainage features, and build erosion control structures to stabilize trail cross sections on 21 miles of trails above 6,000 feet elevation.

Warning Signs COMPLETED: Signs to warn the public of flood danger, rockslide danger, and keep off the rehabilitation area will be placed as needed in the General Hitchcock, Willow Canyon, Rose Canyon, Barnum Rock, Sollers, Loma Linda Picnic Ground, and Oracle Control Road areas.

Structures:

N/A

I. Monitoring Narrative:

As the seeding is done, monitoring to insure that between 20 and 60 seeds per square foot are being seeded. Seeding effectiveness will need to be monitored in the Fall. If sufficient germination has not occurred, another application for funds will be made to reseed.

There is a need to monitor the effectiveness of all treatments implemented as part of the Bullock Fire BAER.

Currently there are no known Federal or State listed noxious weeds in the fire area. We will be monitoring for occurrence for three years.

Cross Sections in Alder Canyon will be taken to determine the effects of the fire on flows and sediment.

This will require one week after the summer monsoon season by two journey level resource specialists. Photo points will be established in treated and untreated areas.

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

Line Items	Units	Cost	Units	SULT \$	\$	units	\$	Units	\$	\$
A. Land Treatments										
Aerial Seeding	acres	75	6000	\$450,000			\$0		\$0	\$450,000
Aerial Mulching	acres	1200	427	\$512,400			\$0			\$512,400
Ground Seeding & Mulching	acres	100	18	\$1,800			\$0		\$0	\$1,800
Early Warning System	each	5000	1	\$5,000						\$5,000
Fencing	mile	5000	1	\$5,000						\$5,000
Hazard Tree Removal	acres	217	12	\$2,604			\$0		\$0	\$2,604
<i>Subtotal Land Treatments</i>				<i>\$976,804</i>			<i>\$0</i>		<i>\$0</i>	<i>\$976,804</i>
B. Channel Treatments										
Debris Clearing	miles	1100	3	\$3,300			\$0		\$0	\$3,300
Trash Racks	areas	3000	3	\$9,000			\$0		\$0	\$9,000
Diversions	each	8340	1	\$8,340			\$0		\$0	\$8,340
				\$0			\$0		\$0	\$0
<i>Subtotal Channel Treat.</i>				<i>\$20,640</i>			<i>\$0</i>		<i>\$0</i>	<i>\$20,640</i>
C. Road and Trails										
Control Road	miles	6,000	6.2	\$37,200			\$0		\$0	\$37,200
Hydromulch	miles	3,000	16	\$48,000						\$48,000
Willow Canyon	funded	0	0	\$0			\$0		\$0	\$0
Warning Signs	each	192	78	\$14,976						\$14,976
Rose Canyon	miles	45565	1	\$45,565			\$0		\$0	\$45,565
Trails	miles	10525	21	\$221,025			\$0		\$0	\$221,025
<i>Subtotal Road & Trails</i>				<i>\$366,766</i>			<i>\$0</i>		<i>\$0</i>	<i>\$366,766</i>
D. Structures										
				\$0			\$0		\$0	\$0
<i>Subtotal Structures</i>				<i>\$0</i>			<i>\$0</i>		<i>\$0</i>	<i>\$0</i>
E. BAER Evaluation										
	person-days	300	149	\$44,700			\$0		\$0	\$44,700
	perdiem	25	110	\$2,750			\$0		\$0	\$2,750
G. Monitoring Cost	person-days	350	10	\$3,500			\$0		\$0	\$3,500
H. Totals				\$1,415,160			\$0		\$0	\$1,415,160

PART VII - APPROVALS

- _____

Forest Supervisor (signature)

Date
- _____

Regional Forester (signature)

Date