USDA-FOREST SERVICE FS-2500-8 (7/00)

Date of Report: 05/18/04

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[ ] 1. Funding request for estimated WFSU-SULT funds
[X] 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

[X] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Cachuma

B. Fire Number: CA-LPF 733

C. State: CA

D. County: Santa Barbara

E. Region: 5

F. Forest: Los Padres

G. District: Santa Lucia/Santa Barbara

H. Date Fire Started: May 3, 2004

I. Date Fire Controlled: May 13, 2004

J. Suppression Cost: about 3 million

K. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 1
2. Fireline seeded (miles): none
3. Other (identify): Potholes filled on 5 miles of paved road, 10 miles of dirt road repaired, cut brush along road chipped, camp and helibase rehabbed.

L. Watershed Number: 5th field HUC = 1806001002, Middle Santa Ynez

M. Total Acres Burned: 1100
NFS Acres (1040) Other Federal ( ) State ( ) Private (60)

N. Vegetation Types: Chaparral, oak woodland, mixed conifer

O. Dominant Soils: Lodo-Hambright-Millsholm families association

P. Geologic Types: Cretaceous sandstones and shales

Q. Miles of Stream Channels by Order or Class: Order 1: 7.5 miles

R. Transportation System: Trails: 0 miles Roads: 2.2 miles County: 0.25 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 502 (low) 133 (moderate) 70 (high) 405 (unburned within)

B. Water-Repellent Soil (acres): 180

C. Soil Erosion Hazard Rating (acres): 530 (low) 318 (moderate) 262 (high)

D. Erosion Potential: 31 tons/acre

E. Sediment Potential: 9424 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 7

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

C. Equivalent Design Recurrence Interval, (years): 10

D. Design Storm Duration, (hours): 24

E. Design Storm Magnitude, (inches): 9.5

F. Design Flow, (cubic feet / second/ square mile): 40

G. Estimated Reduction in Infiltration, (percent): 35 (70% at mine)

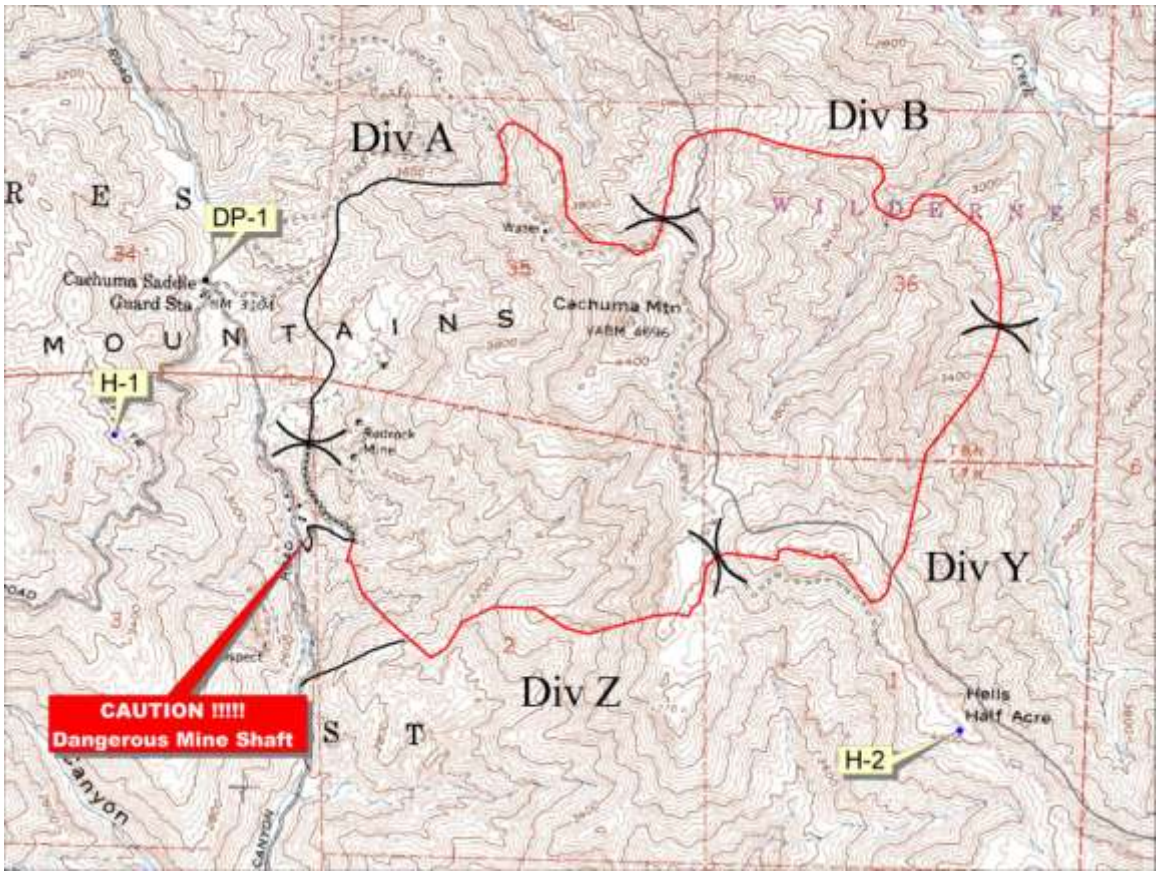
H. Adjusted Design Flow, (cfs per square mile): 138

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:
B. Emergency Treatment Objectives:

Introduction

The Cachuma Fire started at the Redrock Mine (private land) on the afternoon of May 3, 2004 and quickly burned to the ridgeline near Cachuma Peak that afternoon. On May 4, only three engine crews were available because of the early season, and so the fire continued to spread eastward, over the ridge and into Manzana Creek Drainage. After May 5, most of the large runs had taken place. Approximately 640 acres burned in the Cachuma Watershed (Div A and Z), mostly in moderate to light severity, and about 400 acres burned in the Manzana Watershed (Div B and Y), mostly in light severity.



Manzana Watershed

The eastern half of the fire burned in the upper Manzana watershed, which lies almost entirely within the San Rafael Wilderness. There are no structures or hazards to life or other natural resources from the fire in the watershed. Steelhead and red-legged frogs occur downstream from the fire several miles, but the small amount of burned acreage and overall low to moderate intensity, as well as an intact riparian zone, limits the effect of the fire to these species to an undetectable level. We feel that no BAER treatments are needed in the Manzana watershed.

Cachuma Watershed

Water Quality: sediment

The Cachuma watershed flows about 14 miles southward into Lake Cachuma, a domestic water supply for Santa Barbara, CA. The Upper and Middle Santa Ynez watershed above Lake Cachuma is 267,601 acres, but only 640 acres or 0.25 percent of this watershed burned. Extra sediment due to the fire will be delivered into Lake Cachuma, but this delivery will take place over many years and will probably fall within the natural range of variability of sediment delivery. The increase in sediment delivery from this burn is equivalent to about 50 percent of the normal one year total for the Cachuma Creek watershed above Lazaro Canyon, a small portion (about 3 percent) of the entire Lake Cachuma watershed. This increase will come about during the first rainy season, but delivery from Cachuma Creek into Lake Cachuma will take many years or decades.

Because this is such a small increase in the total amount of sediment added to Lake Cachuma, we do not recommend any treatment to the Cachuma watershed.

Water Control: culverts

There are two culverts along the Happy Canyon road. Increased sediment and water yields due to the fire threaten to overflow these culverts and damage the Happy Canyon road.

Objective: The objective of this treatment will be to allow unobstructed flow of water under the Happy Canyon road, and avoid road damage due to overflow of the drains.

Water Control: road drains

The road that leads uphill from the mine site to the oak grove where several abandoned cars lie will now receive more water than the road drainage is designed for. This road enters the mine site, and will carry water onto the area where hazardous materials and soil lie.

Objective: The objective is to prevent excess overland water flow from the burn from channeling down this road then through the mine site and forming a gully that will erode hazardous materials into Cachuma Creek.

Introduction of Noxious Weeds

Purple star thistle is a noxious weed that grows along Happy Canyon road. This is the sole access point into the fire, so all crew buggies, engines and heavy equipment drove through this infected area before entering the fire. The ten-mile long McKinley Mountain road, which leads into the fire area from Happy Canyon road, is at an increased risk for a purple star thistle infestation, which did not exist before the fire. Purple star thistle grows in sites disturbed by fire or by mechanical means. There is a population of Parish's checkerbloom, a Federally Threatened plant that also grows along the McKinley road and prefers disturbed areas similar to purple star thistle habitat. An introduction of purple star thistle could compete with Parish's checkerbloom for resources. Purple star thistle was introduced from fire equipment on the Happy Canyon road during the Marre Fire of 1993, has been greatly reduced by regular monitoring and hand pulling, but still occurs in a few spots. A vehicle wash station was set up at the entrance to the Cachuma fire area, but only after three days of activity. Biologists surveyed for purple star thistle along the road three days after the fire started, and pulled several plants. They noted that purple star thistle along Happy Canyon road had been run over by fire equipment. It is likely that fire equipment has introduced the plant onto the McKinley Mountain road.

Objective: The objective of this treatment is to prevent an infestation of purple star thistle along the McKinley Mountain road, and to protect the population of Federally Threatened Parish's checkerbloom here, where dozer work and fire has created a suitable seedbed for purple star thistle, and fire equipment and crews have likely introduced purple star thistle seed along the road.

Transport of Hazardous Materials

Because the fire will increase runoff and erosion into the mine site (on National Forest System land), there is an increased risk of contaminated soil from the mercury processing site being washed into Cachuma Creek. Mercury compounds from the condensing operations often accumulate in the soil around the retort from fumes, from old condenser equipment, and from tailings left from cleaning the retort. Above normal mercury levels in the air were detected by Santa Barbara hazmat investigators at this site in confined areas. Soil testing is presently under way. Another indication that soil at this site may have elevated mercury is that two firefighters on initial attack experienced a type of dermatitis consistent with mercuric sulfite exposure, which may be released from the soil with heat from the fire. Other similar mines in this area (Rinconada and Deer Trail Mine in San Luis Obispo County on Los Padres NF) have elevated soil mercury at the retort site, and are presently under CERCLA cleanup. The values at risk downstream of the Redrock Mine from mercury and other hazardous materials are the following: Cachuma Creek supports a recreational trout fishery that is stocked every spring; there is

a campground about 1.5 miles downstream from the mine, and visitors recreate in the creek waters; about 14 miles downstream Cachuma Creek flows into Lake Cachuma, which is a municipal water source for Santa Barbara, CA. Mercury can be transported into these waterways and present a public health hazard.

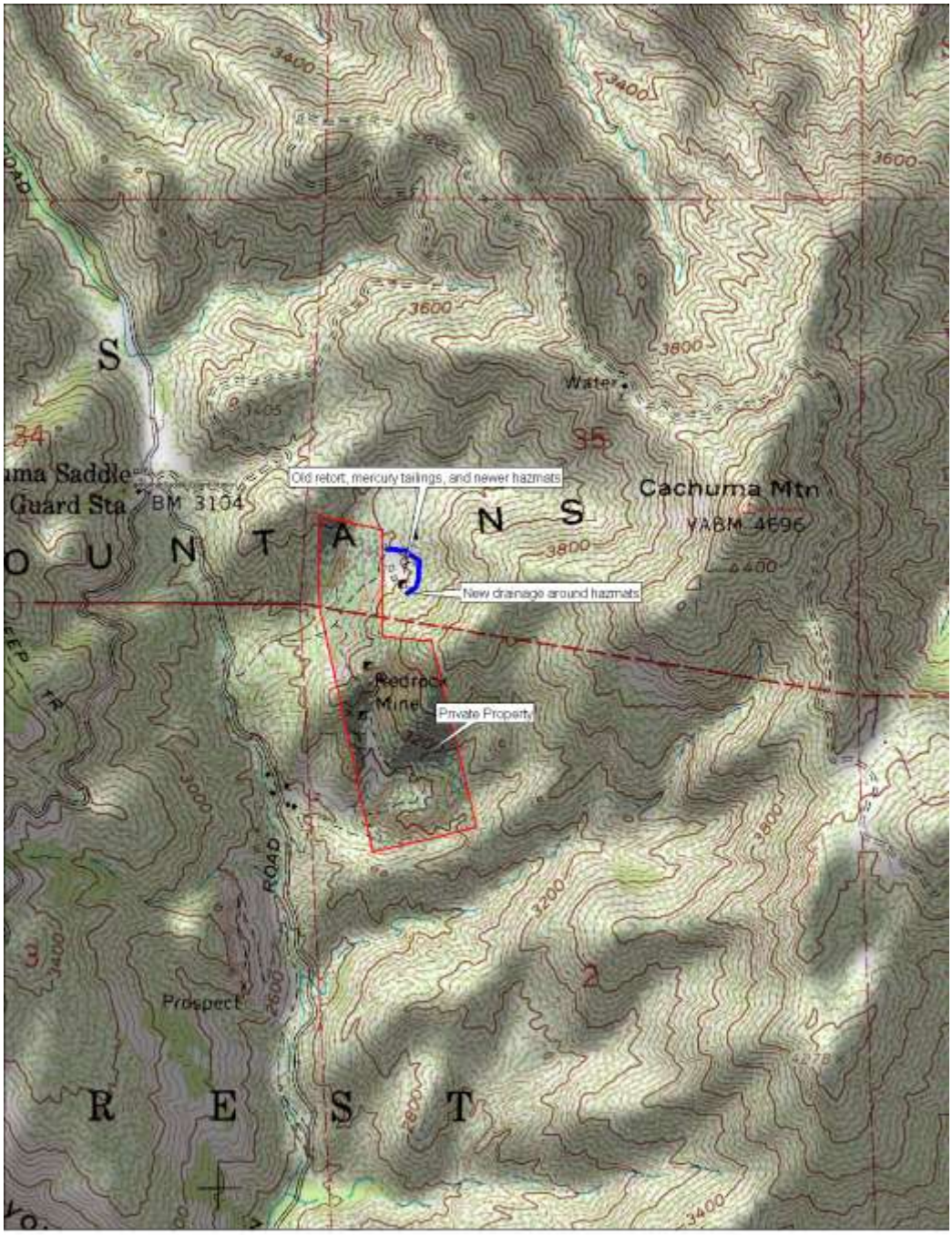
There are also hazardous materials such as paint cans, car batteries, and hydrocarbon products on the private lands below National Forest System land, and on NFS land, that could be washed into the drainage. Santa Barbara County is working with the private landowner to remove these hazardous materials from the private land and the Los Padres National Forest is working with the landowner to remove hazmats from NFS land. It is unknown whether this landowner can or will remove the hazmats before the first fall rains, in which case the hazmats could be transported into Cachuma Creek. The landowner is responsible for moving this material, and this BAER report is not requesting funds to move any hazardous material from either NFS or private land.

Minimal BAER funding is requested to prevent soil with elevated mercury levels from entering Cachuma Creek. In the event that the landowner does not move hazmats off NFS land or his private land, this treatment will also help prevent most of that material from being rapidly moved into Cachuma Creek. We feel that this is a minimal treatment designed to divert excess water around the hazmats. The slopes above the site are over 60%, with a high rock content, and are unsuitable for seeding. We have found that natural regeneration creates 30-90% ground cover in one growing season in this ecosystem, and that the watershed should be completely recovered in 5 to 7 years, so seeding is not recommended.

Cost of cleaning up the non-soil hazmats on NFS land alone could exceed $100,000. Even if this were undertaken as a fallback alternative, the non-soil hazmats on private land would also have to be removed to keep them out of Cachuma Creek, and would double this cost. Removing the contaminated soil and old mining equipment could cost up to 1.5 million dollars, based on cleanup of similar sites.

Objective: The objective is to divert the excess water and sediment resulting from the fire that will enter the hazmat site into a safe passage around the site and that will not move hazardous materials from either Forest or private land into Cachuma Creek. Water from the slopes above the site will be diverted completely around areas that have been identified as hazardous by the Santa Barbara County and by USFS hazmat specialists.

Note on Safety
The materials identified as hazardous are made so mostly through heating or burning, and the exposure risk was mostly to initial attack firefighters. Human-made substances identified such as plastics, solvents, paints, hydrocarbons and other materials that can off gas toxic fumes when heated, are not nearly the inhalation hazard after being burned and cooled down. The fire safety officer was briefed on hazmats by the Santa Barbara County Hazmat coordinator; this safety officer escorted the BAER team to the mine site for our first visit, showed us the hazardous areas and materials, spoke to us about possible exposures, and gave us written information from the Chemical Hazard Response Information System on the exposure risk to these chemicals. It was not felt that the exposure risk was high enough to require any special equipment, and the County Hazmat specialists and USFS hazmat specialist visited the site with the BAER team. Exposure to mercury in the soil was not considered hazardous to us since it was basically inert, and not being raised in dust at the time of our visit. These materials could be considered hazardous if mechanically agitated, broken down, or washed into a waterway.



Map showing the Redrock Mine private land (red line) and the diversion around the hazmat area on NFS land (blue line).

Photo 1. Looking into the mine area. Note the upper road where water from the drainages will be diverted to the left and into a natural drainage clear of hazmats.

Photo 2. Looking down onto the mercury processing site and adit. The bottom ¾ of this photo is NFS land. There are many hazmats scattered throughout this area, as well as elevated mercury levels in the soil.

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

Land **NA** % Channel **90** % Roads **90** % Structures **90** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	NA	NA	NA
Channel	75	90	95
Roads	75	90	95
Structures	70	70	90

E. Cost of No-Action (Including Loss): **$1,816,000**

F. Cost of Selected Alternative (Including Loss): $21,500

G. Skills Represented on Burned-Area Survey Team:

[x] Hydrology	[x] Soils	[x] Geology	[ ] Range	[ ]
[ ] Forestry	[x] Wildlife	[x] Fire Mgmt.	[x] Engineering	[ ]
[ ] Contracting	[ ] Ecology	[x] Botany	[x] Archaeology	[ ]
[x] Fisheries	[ ] Research	[ ] Landscape Arch	[ ] GIS	

Team Leader: Kevin Cooper

Email: kccooper@fs.fed.us Phone: (805) 925-9538 x216 FAX: (805) 961-5781

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: None

Channel Treatments: The culverts need to be cleared on a regular basis throughout the rainy season to maintain flow. Also, any floatable materials such as sticks and logs should be cleared out 200 feet above the culverts, but live, well-rooted materials in the riparian zone should be left intact to trap debris from upstream. There are two drains: one at the Redrock Mine entrance, and one about ¼ mile down the road. Both of these are clear of sediment at this time, but need some live vegetation cut from the entrance of the culvert, and some clearing of logs above the culvert. This initial clearing will take one fire engine crew approximately one day of work. Clearing throughout the wet season will be done on a regular basis with Forest funds, as is normally done. If major damage or plugging occurs to either of these due to increase flow from the fire, an updated request for BAER funds will be submitted.

Cost: The approximate cost for this work will be $1000.

Results: Fire crews cleared both of these culverts during the summer of 2004. Nonetheless, extremely heavy rains during the winter of 2004-05 challenged both of these culverts and

plugging the lower one during the first large storm, resulting in a near-total washout of the Cachuma Saddle paved road. This road and the culvert were repaired with non-BAER dollars.

Roads and Trail Treatments: Eleven dips need to be enhanced along the road which leads up from the mine site into the oak grove to divert water.Excess water from the burned watershed could channel down this road and into the mine area containing hazardous materials if the drains are not re-constructed to divert the water off of the road.

Cost: This work will be done with the other heavy equipment work mentioned below to divert water from the area, so the cost of transportation of equipment is shared. The cost of this work will be approximately $2000.

Results: The dips were constructed prior to heavy rains and successfully diverted water away from the mine sites.

Structures: In order to prevent water from the three drainages above the mine site from transporting hazardous materials into Cachuma Creek, the three small drainages (3.1 acres, 7 acres, and 3.6 acres) will be diverted onto the road above the mine and above any hazmats. This water will run down the road and enter a small drainage at the top of the mine site then flow through the mine area without affecting any hazardous materials. Santa Barbara County hazmat specialists and USFS hazmat specialists examined the site and determined this diversion would circumvent the probability that excess runoff generated by the burned watershed would rapidly deliver hazardous soil and hazardous wastes into Cachuma Creek. A small bulldozer and backhoe will be used to in-slope the road to an appropriate depth and to berm the areas where the drainages hit the road in order to capture sediment and prevent the water from flowing down into the mine area. The diversion will be re-visited up to three more times during the first winter to remove excess sediment, re-build berms, and clear the channel. Most of the sediment loaded in these channels through dry ravel will unload during the first storms. Once the bulk of this sediment is removed, the total volume of water coming off of these drainages will easily be held by this channel system. The road was impassable and unused before the fire, but was re-established as an attempted fire line during initial attack. This road is on USFS land, and there is no need or use for this road other than the intended water diversion at this time. This road will experience some erosion from water flow, but the base material that it will flow over is fairly solid rock, and unlikely to fail completely as a watercourse. After 5 to 7 years, when the vegetation has completely stabilized the site, and the threat of transporting hazardous materials is reduced, this diversion will be rehabilitated with other funds as available.

Cost: This estimate assumes four move-ins with heavy equipment – once for the initial clearing and three more maintenance visits.

Salary for operator and swamper	7200
Moving equipment	1200
Backhoe rental	1500
D5	7000
Total	$16,900

Results: The diversion was created as planned along the abandoned road during the fall of 2004, and withstood the heavy rains (over 70 inches) of winter. All three drainages eroded heavily above the road diversion, indicating high energy flows occurred there, but these drainages remained stable with very little sign of water flow below the road diversion, thus preventing mobilization of mine wastes and other hazmats. This diversion was maintained once during the winter. After one year, the vegetation coverage is approximately 60 percent, greatly reducing the potential for hazmat mobilization during subsequent years.

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.)

Introduction of Noxious Weeds: Purple star thistle is a noxious weed that grows along Happy Canyon road. This is the sole access point into the fire, so all crew buggies, engines and heavy equipment drove through this infected area before entering the fire. The ten-mile long McKinley Mountain road, which leads into the fire area and eventually the San Rafael Wilderness area, is at an increased risk for a purple star thistle infestation, which did not exist previously. Purple start thistle grows in sites disturbed by fire or by mechanical means. There is a population of Parish's checkerbloom, a Federally Threatened plant that also grows along the McKinley road and prefers disturbed areas similar to purple star thistle habitat. An introduction of purple star thistle could compete with Parish's checkerbloom for resources. Purple start thistle was introduced from fire equipment on the Happy Canyon road during the Marre Fire of 1993, has been greatly reduced by regular monitoring and hand pulling, but still occurs in a few spots. A vehicle wash station was set up at the entrance to the Cachuma fire area, but only after three days of fire activity. Four days after the fire started, biologists surveyed for purple star thistle along the Happy Canyon road, and found and pulled several plants, so it is likely that fire equipment has introduced the plant onto the McKinley Road.

Treatment Recommended:

Objective: The objective of this treatment is to prevent an infestation of purple star thistle along the McKinley Mountain road, and to protect the population of Federally Threatened Parish's checkerbloom here, where dozer work and fire has created a suitable seedbed for purple star thistle, and fire equipment and crews have likely introduced purple star thistle seed along the road.

Means: We propose to monitor and treat any purple start thistle infestations by driving the McKinley Mountain road once every month, starting after the fall rains in October, and pulling or digging out by hand any new purple star thistle. We will need to continue this for up to three years. The most likely successful strategy will be early diligence in removing new plants. One person driving slowly can identify new purple star thistle plants along the road and can easily stop to pull them out by hand. When done early and regularly this tactic works well, as was experienced on the nearby Happy Canyon Road purple star thistle invasion. If purple star thistle becomes established, then eradication is much more difficult and costly, and would require the use of herbicides. The proposal at this time will be for one year of funding, from October to June of 2005 (8 months). Cost will be wages and mileage for a GS-7 for 8 days. Future funding through BAER may be necessary, and would be requested in future updates to this report.

Cost: The cost will be approximately $1,600 for the first year (until June of 2005).

Cachuma Fire Baer Noxious Weed Monitoring 2004-2005

August 25, 2004

On August 25 Thomas Murphey and Kenneth Krueger removed about fifteen purple star thistles (*Centaurea calcitrapa*) from around the Cachuma Campground. Surveys for purple star thistle were also conducted along the Sunset Valley road (8N09). No thistle was found. Yellow star thistle (*Centaurea solstitialis*) was patchy all along the Happy Canyon road (see Map 7)

November 17, 2004

Kenneth Krueger surveyed for purple star thistle along the Happy Canyon road (7N07) and removed about six purple star thistles from around the Cachuma Campground. He also removed a Pampas Grass off the Happy Canyon road about 3 miles south of the fire area (see Map 8).

February 9, 2005

Kevin Cooper, Thomas Murphey and Valerie Hubbartt checked the road near the Red Rock mine area for erosion. The road appeared to be holding up fairly well. Valerie Hubbartt checked for purple star thistle along the Happy Canyon road. None was seen (see Map 9).

June 9, 2005
Thomas Murphey (Wildlife Biologist, GS-09) drove out to the end of the McKinley road and walked to the Santa Cruz Station. He found tocolote all along the road and trail to the station (see Map 10). A total of 16.5 miles were surveyed.

August 2, 2005
On Kenneth Krueger checked along the Happy Canyon and Sunset Valley road (8N09) for purple star thistle. About fifteen large plants were removed along the Happy Canyon road (see Map 11).

August 8, 2005
On August 17 he checked near Cachuma Camp and removed about twenty plants. The plants were young enough that the seed heads were not mature. Near Cachuma Campground there were over a dozen small seedlings that will be removed at a later date. Kenneth also checked on the McKinley road. No purple star thistle was found (see Map 12).

Treatment Needed

The Santa Barbara District and Santa Lucia District will continue to remove purple star thistle near Cachuma Campground and monitor for further infestations along the Happy Canyon road and the McKinley road as part of the forest noxious weed program.

No BAER funding is sought to continue this monitoring.

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

Line Items	Units	Unit Cost	# of Units	WFSU SULT $	Other $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
				$0			$0	0	#######	$0
				$0			$0		#######	
hazmat cleanup				$0			$0	1	#######	$100,000
				$0			$0		$0	$0
Subtotal Land Treatments				$0			$0		#######	$100,000
B. Channel Treatments				0						
				$1,000			$0		$0	$1,000
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Channel Treat.				$1,000			$0		$0	$1,000
C. Road and Trails										
				$2,000			$0		$0	$2,000
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Road & Trails				$2,000			$0		$0	$2,000
D. Structures				$0						
				$16,900			$0		$0	$16,900
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Structures				$16,900			$0		$0	$16,900
E. BAER Evaluation				$0						
				$7,090			$0		$0	$7,090
				$0			$0		$0	$0
G. Monitoring Cost				$1,600			$0		$0	$1,600
H. Totals				**$28,590**			**$0**		#######	**$128,590**

PART VII - APPROVALS

/s/ Bruce Emmens (for): _____ 9-26-05

GLORIA BROWN , Forest Supervisor — Date

_____ _____

Jack Blackwell, Regional Forester — Date