FINAL REPORT

AGUANGA FIRE REHABILITATION REPORT
PALOMAR RANGER DISTRICT
CLEVELAND NATIONAL FOREST

by
GENE BLANKENBAKER
FOREST HYDROLOGIST, REHAB. TEAM LEADER
6/11/84

INTRODUCTION

The Aguanga Fire started on 5/30/84 during a lightning storm which was responsible for numerous fires in Southern California at that time. The fire was controlled on 6/4/84 after burning a total of 6,430 acres, 4,450 of which were National Forest lands. Total suppression costs were estimated to be $2,500,000.

The fire started south of the town of Aguanga, and burned (generally) in a southerly and easterly direction. A large percentage of the burn area was in a proposed wilderness area (Cutca RARE II). The last recorded fire in this area had occurred in 1928 (Beauty Mountain Fire), making the brush about 55 years old.

The District Ranger requested a burn rehabilitation team on Friday, 6/1/84. The team consisted of a fairly large number of people, most of which were participating on a rehab team for the first time. The team consisted of:

Gene Blankenbaker (Team Leader)
Norm Noyes (District Representative/liaison)
E. Nelson Dean
Tom Ryan
Judy Sheppard
Melody Mobley
Russ La Joie
Don Holsapple
Joe Raynoha

The rehab team had the following objectives:

1. Survey Burn Area
2. Appraise damages and flood threat
3. Conduct E.A.
4. Determine what emergency rehab and resource use adjustments are needed
5. Request funds to complete emergency rehab
6. Maintain RARE II Area in as natural a condition as possible

Based on the above objectives, it was decided that there were data gaps which could be filled during field reconnaissance. These items included;

1. Mapping miles of bulldozer line
2. Mapping areas needing revegetation (artificial)
3. Measuring miles of road needing repair
4. Measure miles of stream channel by Regional Order
5. Compute E.H.R. and erosion potential
6. Map extent and severity of water-repellant soils
7. Map miles of road and trail by maintenance class

The burn rehab team spent the next two days (Saturday and Sunday) doing field work in the burn area. The team leader coordinated team activities, interfaced with the Incident Commander and Plans Section, and coordinated with other agencies. The team leader also began work on the Burned Area Report (FS 2500-8) and the Environmental Assessment.

On Monday, 6/4/84, the fire was declared controlled. The burn rehab team finished their field work that morning and had an interdisciplinary team meeting to develop alternatives for the District Ranger to consider. The following assumptions were used in developing the alternatives:

-Seeding will only be successful if the 1st couple of storms are low intensity

-High downstream values will warrant higher priority (degree) of rehab

-Repellancy and crusting is widespread and will minimize effectiveness of seeding

-All tractor lines in need of water bars have been treated

-RARE II area will be left as natural as possible

-Public involvement will be important

Some of the information the survey team collected is summarized on the Burn Area Report, but will be elaborated on here. Two major watersheds were burned by the fire, Long Canyon and Cottonwood Creek. Of the two, Cottonwood had the largest percent area burned (47%), with Long Canyon having 15 percent burned. Both steams are intermittant, and flow into Temecula Creek.

The burn area was surveyed for water-repellant soils, and it was determined that the repellancy was extensive and fairly uniform (1/2"-1" below the surface). A crusting on the surface was also noted.

Unburned islands were mapped. Very few islands remain in the burn (about 5% of the total burn area), and those that are present are on north-facing slopes and on the southern boundary of the fire. Most of the riparian areas were not burned severely (overstory not killed).

Finally, there were very few downstream improvements which could be affected by floods and debris coming off the burn area. Cottonwood Creek has one development (trailer) near the mouth which may be close enough to the creek to be of concern.

Long Canyon has a water line, a couple of ponds, and a couple of ranches downstream, but all appear to be out of the flood-prone area.

ALTERNATIVES

After brainstorming a list of possible burn area treatment alternatives, four Management Alternatives were developed. These alternatives were as follows:

A. DO NOTHING

This alternative proposed to do no further treatment to any areas within the burn. The only activity which would be allowed would be to return the roads used during suppression to their former condition.

B. I.D. TEAM PREFERRED

This alternative recommends limited rehabilitation work, most of which is concentrated on bulldozer lines and roads. This alternative would provide for;

-Fertilizing all bulldozer lines in the RARE II Area

-Seeding bulldozer lines along the front country with native species

-Blocking off the bulldozer in above Dameron Valley to prevent subsequent ORV damage

-Remove hazard trees along Cutca Road and Cutca Trail

-Do necessary road re-grading and overside drain clean-out and install energy dissipators where needed

-Replace cattle guard and fences damaged by suppression activities

C. INTENSIVE STRUCTURAL TREATMENTS

This alternative is the same as Alternative B except for the following proposal;

-Build small erosion control structures (check dams) in the headwaters of burned watersheds to prevent erosion. At least 20 structures would be anticipated and would be used in 1st order drainages to help keep soil from moving off site.

D. MAXIMUM REVEGETATION EFFORT

This alternative proposes to treat the entire burn area by aireal seeding. The RARE II portion would be seeded with native species if at all possible, while the rest would be seeded with annual rye. Steep areas would have to be seeded with coated seed in order to ensure that at least some seed would remain on the slopes long enough to germinate.

DISCUSSION OF ALTERNATIVES

The I.D. team discussed all alternatives, and decided that all were feasible. However, since the downstream values at risk are relatively small, the cost of rehabilitation became a major issue. Also, the probability of success (in terms of the proposed treatment having an effect in terms of flood reduction and/or erosion control) was evaluated for each alternative.

Alternative A was the least expensive, but did not address the issue of trying to restore the RARE II area in as natural a state as possible. Because it does allow for road work, it was felt that this would have a positive affect on the sediment generated from the burn area (would reduce the total amount generated). However, it does little to protect the resource from further degradation such as by ORV's.

Alternative B fully treats the critical fire damaged and suppression damaged resources. It allows for rapid revegetation of bulldozer lines, and protects the resource from further damage. It also, through road maintenance work, reduces the sediment produced from the burn.

Alternative C does everything Alternative B does with the added proposal of building small check dams in upper drainages to attempt to hold soil on site. The additional cost of building these structures, however, does not necessarily translate into a significant difference in sediment reduction downstream. This is due mainly to the fact that most of the sediment anticipated from the burn area will be as a result of roads and steep canyon slopes immediately above Cottonwood Creek and Long Canyon Creek. These structures will not be contributing toward erosion from either of these sources.

Alternative D proposes to broadcast seed the entire burn. The objective would be to establish at least 50% groundcover by the end of the first season to reduce erosion and help prevent flooding. This alternative has a number of drawbacks in this case. First, the cost was estimated to be in excess of $60,000, or over 3 times as expensive as the other alternatives. Also, because of the widespread water repellancy and crusting found in the burn area, the probability of success in terms of getting grass established through these soil layers was judged to be very low.

EVALUATION CRITERIA AND SELECTION OF AN ALTERNATIVE

The alternatives were evaluated using the following criteria, and were presented to the District Ranger in this way.

EVALUATION CRITERIA

1. Provides effective localized protection (i.e., dozer line erosion control)
2. Would likely prevent unacceptable downstream impacts in the 1st year
3. Maintains the RARE II area in as natural a condition as possible
4. Has a positive benefit/cost ratio
5. Total cost

EVALUATION CRITERIA

ALTERNATIVE	1.	2.	3.	4.	5.
A	no	no	yes	yes	$ 4,000
B	yes	yes	yes	yes	$13,000
C	yes	yes	yes	yes	$23,000
D	yes	yes	yes	no	$60,000

Based on the above and the recommendation of the I.D. team, the District Ranger selected Alternative B as the preferred alternative.

SCHEDULE FOR COMPLETION OF EMERGENCY WORK

The following is a schedule for completion of the emergency rehabilitation work. The work will be done largely by District personnel with the exception of road maintenance work. Due to the fact that the fire was so early in the season, the seeding portion of the work will be delayed until later this summer to reduce the potential for its loss (being windblown or eaten).

ACTION ITEM	DATE
-Recondition Road surfaces (engineering)	June 4-15
-Purchase seed, fertilizer, fence material, and cattleguard	July 1-15
-Do hazard tree work Cutca Road/Trail	July
-Install fences and cattleguard	August/September
-Fertilize bulldozer lines	September
-Install trash rack (engineering)	September
-Hand application of seed on bulldozer lines	September
-Re-evaluate road needs/place energy dissipators below culverts and overside drains if needed (engineering)	September

LONG-TERM NEEDS/OPPORTUNITIES

Three items have been identified as important in terms of long-term management of the burn area (long-term being something that can be considered over the next 1-3 years). The first was to survey and assess the need for additional water developments for wildlife in the area. This would be relatively easy to do before the brush re-sprouts, and could take advantage of new springs. This must be considered in terms of the total wildlife program for the District, and may necessitate shifting priorities for limited structural improvement dollars.

The second item concerns cultural resources. The majority of the burn area has never been surveyed for cultural resources. There is an opportunity to take advantage of the temporary lack of vegetation and do archaeological reconnaissance surveys in the burn. On the other hand, the Forest Archaeologist has also voiced a concern about "pot hunters" also taking advantage of the easy access, and suggests that additional patrols or better control of access into certain areas may be appropriate.

The third item is the opportunity to survey landlines easily in the burn area. The engineering staff needs to assess the value of surveying lines within the burn before they revegetate, and re-prioritize work or ask for additional funds to accomplish this.

SEEDING FOR TRACTOR LINES

Erosion control seed mix (35 lbs./ac x 3 ac. x $3.60/lb.)	=	$380.00
Fertilizer ($0.14/lb. x 1800 lbs./ac x 3 ac.)	=	$756.00
Mileage and Supplies (Engine mileage, P.U. Truck, etc.)	=	$500.00
Labor (5 GS-5's @ $60.00/day x 5 days)	=	$1,500.00
Total		$3,136.00

FERTILIZE RARE II AREAS

4 ac. x 1800 lbs./ac. x $0.14/lb. =$1,000

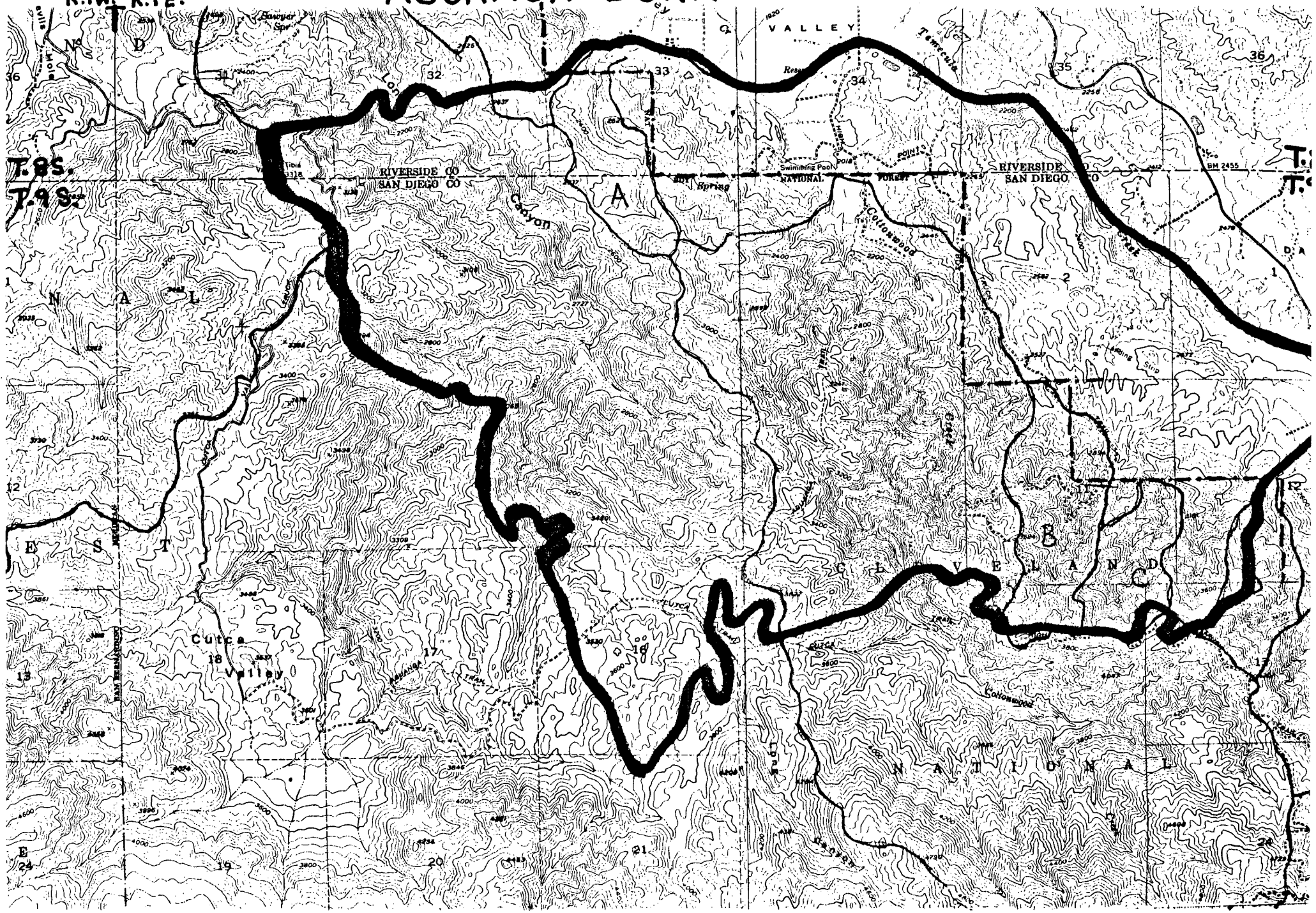
TEMPORARY FENCES

FFF 102 At base of tractor line above Dameron Valley to prevent ORV access to suppression lines.

FFF 092 Approx. 3/4 mile of fence along high point road and other locations to prevent ORV access to burn area and to protect archaeologically sensitive areas.

6/11/

AGUANGA BURN



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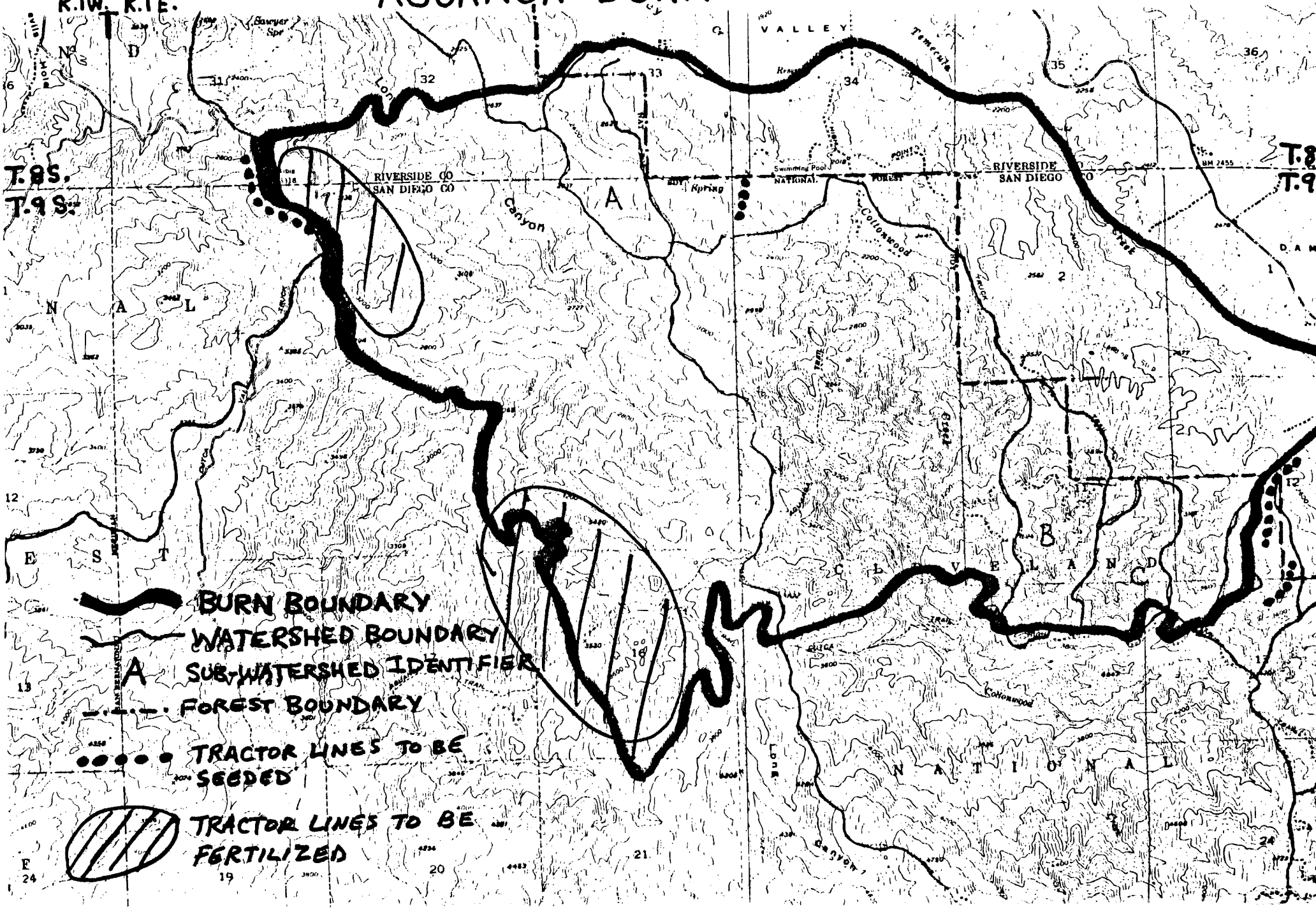
AGUANGA BURN



LIST OF AGENCIES CONTACTED

California Department of Forestry
Soil Conservation Service
California Department of Fish and Game
San Diego County Flood Control
Riverside County Flood Control

USDA—Forest Service

BURNED AREA REPORT

(Reference FSH 2509.13, Report FS-2500-A)

Date of Report: 06/08/84

PART I – TYPE OF REQUEST

1. Type of Report

A. [X] Funding (Request for estimated FFF funds) B. [ ] Accomplishment Report

2. Type of Action

A. [ ] Initial (estimated funding is first requested)

B. [X] Interim

a. [X] Updating the initial funding request

b. [ ] Supplying information for accomplishments to date on emergency work underway

C. [ ] Final

a. [ ] Best estimate for funds needed to complete eligible rehabilitation measure

b. [ ] Following completion of funded work

PART II – FIRE LOCATION

1. Fire Name (From Form FS-5100-29)	2. Forest Supervisor's Fire No. (From FS-5100-29)	3. State	4. County
AGUANGA	318	CA	SAN DIEGO/RIVERSI

5. Region	6. Forest	7. Ranger District	8. Date Fire Started	9. Date Fire Controlled	10. Estimated Suppression
5	CLEVELAND	PALOMAR	5/30/84	6/4/84	$ 2,500,000

11. Fire Suppression Damages Repaired with FFF 102 Funds

a. 2.5 miles (firelines waterbarred) b. 0 acres (firelines seeded) c. Other (identify) 15 mi Roads

12. Fire Intensity

a. 5 % (low) b. 10 % (medium) c. 85 % (high)

PART III – NATIONAL FOREST SYSTEM PROBLEM INVENTORY

1. Watershed No.	2. NFS Acres Burned	3. Water Repellant Soil
1807030203	4450	90 % of NFS acres burned

4. Vegetation Types	5. Geologic Types
CHAPARRAL	MICACEOUS SCHIST, GNEISS, GRANODIORITE

6. Soil Erosion Hazard Rating

a. 5 % (low) b. 15 % (medium) c. 80 % (high)

7. Erosion Potential: 3800 cu. yds/sq. miles

8. Miles of Stream Channels By Regional Order or Classes	9. Miles of Forest Service Trails
13.7 mi CLASS III	0.6 mi

10. Miles of Forest Service Roads By Maintenance Levels

a. _____ miles (Level I) b. 8 miles (Level II) c. 7 miles (Levels III, IV, V)

PART IV – CALCULATED RISK AND CLIMATIC EVALUATION

1. Estimated Vegetative Recovery Period (Years)	2. Chance of Success Desired By Management (Percent)
3	70%
3. Equivalent Design Recurrence Period (Years)	**4. Related Design Storm Duration (Hours)**
10	6
5. Related Design Storm Magnitude (Inches)	**6. Related Design Flow (cfsm)**
2.5	50
7. Estimated Reduction In Infiltration (Percent)	**8. Adjusted Related Design Flow (cfsm)**
90%	245

Previous edition of this form is obsolete.

FS-2500-8 (11/82)

PART V – SUMMARY OF SURVEY AND ANALYSIS

1. Skills Represented on Burned Area Survey Team (x appropriate boxes)

a. ☒ Hydrology b. ☒ Soils c. ☐ Geology d. ☒ Range e. ☒ Timber f. ☒ Wildlife
g. ☐ Fire Mgmt. h. ☒ Engineering i. ☐ Contracting j. ☐ Local Mgmt. k. ☐ Research l. ☒ Other Chaparral (identify)

2. Describe Emergency LIGHTNING FIRE BURNED 50 YEAR OLD BRUSH IN WATERSHEDS TRIBUTARY TO TEMECULA CREEK, IN A RARE II AREA.

3. Emergency Rehabilitation Objective
MINIMIZE IMPACTS ON RARE II AREA
STABILIZE CAT LINES
MITIGATE ON AND OFF-SITE RESOURCE DAMAGES

4. Probability of Completing Treatment Prior to First Major Damage Producing Storm
a. 90 % (land) b. 90 % (channel) c. 100 % (roads) d. _____ % (other) _____ (identify)

5. Net Environmental Quality Benefit Index
a. ☐ Significant b. ☒ Not Significant

6. Net Social Well Being Benefit Index
a. ☒ Significant b. ☐ Not Significant

7. Benefit/Cost Ratio: 2.3/1

8. Net Benefits: $29,500

9. Cost Effectiveness Index
a. ☐ I b. ☐ II c. ☒ III d. ☐ IV

PART VI – ELIGIBLE EMERGENCY REHABILITATION MEASURES OR TREATMENTS & SOURCE OF FUNDS

Note: Emergency rehabilitation is work done promptly following a wildfire and is not to solve watershed problems that existed prior to the wildfire.

	Line Items (1)	Units (2)	Unit Cost (3)	NFS Lands No. of Units (4)	NFS Lands FFF 092 $ (5)	NFS Lands Other $ FFF 102 (identify) (6)	Other Lands No. of Units (7)	Other Lands Federal $ (identify) (8)	Other Lands Non-Federal $ (identify) (9)	All Lands Total $ (10)
A. LAND	a. Seeding	Acres	1000	3	3000					3000
	b. TEMPORARY FENCES	MILES	2500	1.0	2500					2500
	c. CATTLEGUARD	EACH	1700	1		1700				1700
	d. HAZARD TREE REMOVAL	ACRES	50	10		500				500
	e. FERTILIZER/CAT TRAILS	MILES	100	4		400				400
B. CHANNELS	a. Opening water courses	Miles								
	b. Stabilizing Streambanks	Miles								
	c. TRASH RACK/ROCK	EACH	400	1	400					400
	d.									
	e.									
C. ROADS & TRAILS	a. RECONDITION ROADS	MILES	167	15		2500				2500
	b. OVERSIDE DRAIN ARMORING	EACH	100	20	2000					2000
	c.									
	d.									
	e.									
D. MAJOR STRUCTURES										
	a. Preplanned – from Forest Plans									
E. TOTAL					7,900	5,100				13,000

PART VII – APPROVALS

1. Forest Supervisor (Signature)	2. Date	3. Regional Forester (Signature)	2. Date
for Fred Gregory Ralph Cisco	6/11/84		

APPENDIX

RESOURCE NARATIVES

NARRATIVE FOR SOILS - AQUANGA FIRE

The majority of the burn area is underlain by Sheephead, rocky fine sandy loam soils on 30 to 65 percent slopes (Mapping Unit SpG2). These are shallow well drained soils that formed in material weathered from micaceous schist and gneissic rocks. The substratum in these soils is readily penetrated by roots from shrub species. Other soils that occur in the burn area in minor amounts are Cieneba, Friant, Bancas and La Posta series.

Field inspection indicates this high entensity wild fire formed a hard crust over large portions of the soil surface. In many places powdered ash deposits occur on top of the crust layer. Moderate to strong soil repellency was extensive in the burn area. The organic ash-mineral soil interface was often highly repellent and water droplets remained clear and intact on top of the ped surface for long durations (> 5 minutes). Most soil duff layers were burned to powdered ash deposits.

More than 50 percent of the remaining brush canopy had most leaves burned off their limbs but there were many remaining skeleton limbs and branching above ground surface.

In summarizing, the above post fire soil conditions can be expected to produce high amounts of surface erosion in terms of sheet, rilling, gullying and dry ravel movement. The soils have high erosion hazards on these steep slopes and the removal by fire of their vegetative cover will greatly increase their erosion potential.

THOMAS M. RYAN
Soil Scientist, South Zone

TMRYAN:crp

9-213 H

GEO
WATER RESOURCES DIVISION

File ICS

PEAK FLOW CALCULATIONS - AGUANGA BURN

WATERSHED	AREA TOT. (Sq. Mi.)	AREA BURNED (Sq. Mi.)	% OF WATERSHED ON N.F.S. LANDS	TOT. WATERSHED % BURNED	PEAK FLOWS* (CFS) PRE-BURN 10 YEAR	PRE-BURN 100 YEAR	POST-BURN 10 YEAR	POST-BURN 100 YEAR
LONG CYN.	15.4	2.38	100%	15%	700	3,370	2,200	5,075
COTTONWOOD	5.17	2.43	94%	47%	295	1,360	1,810	2,990
SUB - A	0.30	0.28	100%	94%	31	128	300	377
SUB - B	0.42	0.42	100%	100%	40	170	400	510
SUB - C	0.23	0.23	100%	100%	25	103	250	309
SUB - D	0.26	0.17	100%	64%	28	202	180	287

TOTAL ACRES OF FIRE; F.S. AND PVT. = 6,430
F.S. 4,450 (70%)
PVT. 1,980 (30%)

* CALCULATED USING REGIONAL FLOOD-FREQUENCY EQUATIONS FROM U.S.G.S. WRI 77-21, MAGNITUDE AND FREQUENCY OF FLOODS IN CALIFORNIA by Waananen and Crippen, 1977.

Sheet No. ..... of ..... Sheets. Prepared by ..... Date ..... Checked by ..... Date .....

U.S. GOVERNMENT PRINTING OFFICE : 1960 O - 564019

AGUANGA BURN

TIMBER IMPACTS

The riparian ecosystem is the primary area type which supports tree species within the Aguanga burn boundary. Limited populations of mature Coast live oak (*Quercus agrifolia*) occur along stream banks. The oaks sustained light to medium trunk charring and light crown scorching. Understory vegetation was consumed by the fire.

This oak species is well adapted to survive fire damage. No trees will need to be harvested. Some branch pruning will be needed along Cutca trail to remove any fire damaged branches which pose a threat to public safety.

EFFECTS OF THE AGUANGA FIRE ON FISH AND WILDLIFE RESOURCES

Of the 4,450 acres on NFS land that burned, only about 6 percent of the area is left as islands. The islands are not well distributed. They occur in relatively large sizes, primarily as an extension of the perimeter of the burn. Some islands do occur in the interior of the burn area. These are generally one to three acres in size. There is only one water development in the area (a spring at the end of the Cutca Road). The pipe from the spring needs to be repaired so the tank can refill. In repairing the spring pipe, it would require only minor changes to make it usable for wildlife as well as for recreation.

Most of the vegetation that burned was senescent chamise-redshank chaparral. Very little riparian habitat was burned. The riparian areas that did burn were primarily underburned, leaving the canopy in tact. No critically important wildlife habitat was lost. There was one unconfirmed sighting of a live black bear. One rattlesnake, killed by the fire, was also seen. Other than those two reports, no other direct wildlife damage was seen.

In general, the burn will be beneficial to wildlife. Immediate post fire effects will be a decline in deer, small mammals, birds and reptiles. However, senescent stands of this vegetation type tend to reduce the habitat capability (and hence population numbers) of these species. Therefore, the immediate post-fire effects on animal population numbers will probably not be noticeably different from the pre-fire conditions. In 0 to 5 years, with normal weather conditions, the new vegetation growth will provide food, and eventually cover for wildlife, increasing the habitat capability of the area. After 5 years, the new growth on the chamise will be relatively unpalatable for deer, but the redshank will be starting to provide good cover. After 10 years, the canopy will close and shrub cover will increase. Dead material will begin to accumulate, causing a decline in habitat capability.

The creeks in Long and Cottonwood Canyons are intermittent and do not contain either a self-sustained or a put-and-take fishery. The potential for increasing the fishery habitat capability in the area appears low.

Recommendations: I would like to do a ground survey of the fire with Kathy Waller, Jerry Moran, Tom White, and Gene Blankenbaker or Ron Woycheck to assess the wildland resource conditions for future actions. Location of possible sites for water developments should be documented. (Future access and locatability of these sites needs to be kept in mind.)

Prescribed burns adjacent to the wildfire burn area should focus on creating structural diversity through mosiacs to offset the lack of diversity created by the wildfire. Water developments might also be best located in these areas where diversity will be higher. This fire provides a good opportunity to look at what we can do to improve habitat capability in the area.

Judy 6/7/84

Judy L. Sheppard, Wildlife Biologist
cc: Kathy Waller, Palomar
Harold McKinnie, CDF&G