2007 Zaca Fire BAER Assessment
Executive Summary

An initial Burned Area Emergency Response (BAER) assessment has been completed for the 2007 Zaca Fire. Simply put, a BAER assessment has three key objectives:

- To determine if emergency resource or human health and safety conditions exist,
- To identify actions to alleviate emergency conditions following wildfire to help stabilize soil; to control water, sediment, and debris movement; to prevent permanent impairment of ecosystem structure and function; and to mitigate significant threats to health, safety, life, property, or downstream values, and
- To identify monitoring actions needed for the implementation and effectiveness of prescribed emergency treatments.

BAER teams conduct surveys promptly on burned areas to determine if emergency rehabilitation treatment is needed to minimize loss of soil productivity, deterioration of water quality, and threats to human life and property. Treatments are primarily temporary measures that do not generally require maintenance or are removed after objectives have been met. To qualify for funding under the emergency rehabilitation authority (FSM 2523), ensure that proposed burned-area rehabilitation projects meet the following criteria:

- Emergency Rehabilitation Is Necessary To Protect Soil and Water Resources From Unacceptable Losses, or To Prevent Unacceptable Downstream Damage.
- Prescribed Rehabilitation Measures Are Proven Effective and Are Feasible To Implement Before Anticipated Damage-Producing Storms.
- Prescribed Rehabilitation Measures Are Environmentally and Socially Acceptable and Are Compatible With Long-Term Restoration Needs and the Forest Plan.
- Costs Are Minimal While Still Providing Essential Protection.

The following information summarizes key findings contained in the initial Zaca Fire BAER assessment (form 2500-8). Interim BAER reports will be written, if needed.

Area Burned

The Zaca Fire perimeter encompasses 240,207 acres, of which 228,141 acres are National Forest System (NFS) lands.

Soil Burn Severity

Soil burn severity (the amount of heat that is released by a fire and how it affects other resources) on the Zaca Fire has been determined to be as follows:

- High: 33,322 acres (14%)
- Moderate: 129,849 acres (54%)
- Low: 43,101 acres (18%)
- Very low to unburned: 33,935 acres (14%)

Watershed Analyses

Several watershed analyses were completed for the BAER assessment including a water discharge analysis, erosion and sediment analysis, and a qualitative slope stability analysis. Watersheds with the highest predicted increases in erosion include Upper Mono Creek (196 times normal) and East Fork Santa Cruz Creek (194 times normal). Combining the twelve 6th-field watersheds that burned, the modeled erosion potential was 38 times normal. This analysis indicates that increased debris flows, slope movements, and greater sediment generation are likely from the twelve affected watersheds.

Threats to Human Life and Property

The following values were identified during the initial phase of the Zaca Fire BAER assessment process as "at risk" from the effects of the fire including increased runoff and flows, rock and debris fall, erosion and sedimentation, and landslides:

- users of National Forest roads, trails, campgrounds and administrative sites;
- users of State Route 33;
- users of roads, trails, campgrounds and facilities on non-federal land both within and outside the Zaca Fire perimeter.

National Forest property values at risk include:

- roads
- trails
- campgrounds
- facilities (i.e. Pendola Guard Station)
- heritage sites
- Pendola debris dam

There is a high likelihood that National Forest roads, trails and campgrounds could become damaged from the loss of control of water and erosion. Damage could be substantial if prescribed emergency treatments are not implemented. Treatments such as pre-season drainage clearing on roads and trails and the monitoring of these treatments to ensure their effectiveness after each storm will help minimize additional damage and costs. The public is at risk from using National Forest roads and trails for at least the upcoming winter season. To protect life and property associated with the public use of travel routes, hiking trails, and campgrounds within and downslope/downstream of the Zaca Fire, the BAER Assessment Team recommends the temporary, seasonal closure of the burn area to all recreational users.

Private property values at risk include:

- Gibraltar Reservoir
- Lake Cachuma
- State Route 33
- private inholdings within the National Forest boundary
- existing debris dam at Mono Creek
- existing debris dam at Aqua Caliente Canyon
- City of Santa Maria (levee system)
- high-pressure gas pipeline
- Rancho San Fernando Rey (32,000 acre ranch above Lake Cachuma)

Domestic water supplies at risk include:

- City of Santa Barbara water supply (Upper Santa Ynez River Watershed above Gibraltar Reservoir and Middle Santa Ynez River Watershed above Lake Cachuma)

Peak flow increases from the fire will be bulked by ash, debris and other floatable and transportable material within the channel areas. There is a high probability that post-fire flows from the first runoff producing rain events will see a high concentration of ash discharged from the burn area a long distance downstream to the Gibraltar and Cachuma Reservoirs. This has high potential to affect the municipal water supplies in both Cachuma and Gibraltar Reservoirs. The drainage area above Lake Cachuma is a Municipal watershed that supplies drinking water to the entire front country of Santa Barbara County from Carpenteria to Goleta. The total area of watershed burned above Lake Cachuma is about 56%. Of this, 36% burned at high and moderate burn severity. The potential for adverse water quality effects, post fire flooding and sediment yield is very high.

Because the majority of the high severity burn area is inaccessible and on slopes exceeding 60%, most of the burned area is too steep and/or rocky to meet the site selection criteria for hillslope treatments and is therefore untreatable. BAER hillslope treatments are not effective or proven on slopes steeper than 60 percent. Unfortunately, these are steep slopes that are most prone to slope failure. No hillslope treatments are generally

proposed on moderate burn severity lands for a combination of reasons such as the positive vegetative response in grasslands and shrub communities.

The BAER Team recommends maintaining communications with State, County, and Local governmental agencies and adjacent private landowners regarding the inherent watershed response to impending precipitation events. The potential for increased erosion, sedimentation, debris flows and landslides in the burn area and the subsequent potential for flooding downstream of the burn area are topics that have been presented and discussed at coordination meetings with the entities listed above since August. The Forest Service proposes a number of different emergency treatments on National Forest System lands in the BAER report. The Natural Resource Conservation Service works very closely with private entities to provide technical assistance and explore possible treatments in preparation for the winter rainy season. Efforts to minimize the downstream effects from the burn area will require preparation and action by everyone who could be affected.

Biological Values at Risk

Emergency conditions exist for a number of wildlife species due to increases in sediment in riparian areas and the loss of habitat within the burned area. Multiple invasive species are known to occur in the fire area. The BAER Assessment Team recommends treatment in the form of noxious weed detection surveys in the spring and eradication efforts as needed to help control the movement of noxious weeds into and within the burn area.

Heritage Values at Risk

A focused field reconnaissance of some of the highest priority heritage sites within the burn area concluded that the location of these particular sites indicates that: 1) upland erosion onto the sites is not an emergency condition, 2) increased erosion downslope of sites could expose artifacts, 3) foot traffic could increase downslope erosion, and 4) loss of vegetation could allow for more access to the sites. Based on this information, the BAER Team recommends a temporary, seasonal closure of the burn area to all recreational users to protect these sites and other sensitive areas from human caused erosion and to protect forest visitors from the inherent threats posed by the unstable landscape.

Summary

This initial BAER report serves as the Los Padres National Forest's request for $665,444 to implement emergency rehabilitation/protection measures for the Zaca Fire. This funding will facilitate the purchase and installation of closure gates and signs on Forest Service maintained roads, patrolling to monitor for effective area closure, pre-season drainage clearing on Forest Service roads and trails, treatments to protect two heritage sites, and conducting noxious weed detection surveys. We will continue to provide information gathered during this BAER effort to downstream property owners and other jurisdictions to assist them in their planning and preparation for the winter season.

Date of Report: ***October 9, 2007***

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[**X**] 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)

[***X***] 2. Interim Report ***# 1***
[ ] 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: Zaca

B. Fire Number: CA-LPF-001087

C. State: California

D. County: Santa Barbara and Ventura

E. Region: Pacific Southwest Region (R5)

F. Forest: Los Padres

G. District: Santa Barbara, Mount Pinos, Ojai, and Santa Lucia

H. Fire Incident Job Code: P5DP4U (0507)

I. Date Fire Started: July 4, 2007

J. Date Fire Contained: September 2, 2007

K. Suppression Cost: $118,325,000 (as of 9/4/2007)

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): Dozer lines = 422 and Hand lines = 0
2. Fireline seeded (miles): 0
3. Other (identify):

M. Watershed Number: **HUC 5**: 1806000701 (Upper Cuyama River), 1806000702 (Cuyama Valley), 1806000801 (Sisquoc River), 1806000803 (Santa Maria River), 1806001001 (Upper Santa Ynez River), 1806001002 (Middle Santa Ynez River), 1806001003 (Santa Ynez-Solvang), 1807010101 (Ventura River) 1807010207 (Sespe Creek),

N. Total Acres Burned: 240,207
NFS Acres(228,141) Other Federal (0) State (0) Private (12,066)

O. Vegetation Types: Bigcone Douglas-fir, Coulter Pine, Lower Mixed Conifer Forest, Upland Oak Forest, Sargent cypress, Pinyon Pine, Oak Savanna, Coastal Sage or Desert Sagebrush, Mesic Chaparral, Semi-Desert Chaparral, Xeric Chaparral, and Grassland.

P. Dominant Soils: Skalan, Yorba, Millshorm, and Livermore

Q. Geologic Types: Tertiary aged marine and non-marine sedimentary rocks, mostly sandstones and shales.

R. Miles of Stream Channels by Order or Class: Perennial = 83 miles and Intermittent = 1,075 miles

S. Transportation System

Trails: 172.6 miles Roads: 90.0 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): Unburned = 33,935 (14%); Low = 43,101 (18%); Moderate = 129,849 (54%); High = 33,322 (14%)

B. Water-Repellent Soil (acres): 0

C. Soil Erosion Hazard Rating (acres):
185 (low) 39,172 (moderate) 192,724 (high) 8,126 (very high)

D. Erosion Potential: 30 -50 tons/acre

E. Sediment Potential: 16,070 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 5

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

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

D. Design Storm Duration, (hours): 24

E. Design Storm Magnitude, (inches): 5

F. Design Flow, (cubic feet / second/ square mile): 6.6

G. Estimated Reduction in Infiltration, (percent): 36

H. Adjusted Design Flow, (cfs per square mile): 18.1

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

1. **Threats to Human Life and Property:**

Threats to Life: The Zaca Fire burned a total of 240,207 acres, of which 153,601 acres were within the San Rafael and Dick Smith Wilderness. A total of 228,141 acres burned on National Forest System (NFS) lands and 12,066 acres burned on private lands. The following values were identified during the initial phase of the Zaca Fire BAER assessment process as “at risk” from the effects of the fire including increased runoff and debris flows, rock and debris fall, erosion and sedimentation, landslides, and burnt fiberglass guzzlers: users of National Forest roads, trails, campgrounds and

administration sites; users of State Route 33, public use of roads, trails, campgrounds, and facilities on non-federal land both within and outside the Zaca Fire perimeter.

Threats to Property: Values identified as "at risk" due to the Zaca Fire include:

National Forest System Property

Forest Service roads, trails, campgrounds, facilities (i.e. Pendola Guard Station), heritage sites, and Pendola debris dam.

Private Property

Gibraltar Reservoir, Lake Cachuma, State Route 33, private inholdings within NF boundary, existing debris dams at Mono Creek and Aqua Caliente Canyon, City of Santa Maria (levee system), high-pressure gas pipeline, and Rancho San Fernando Rey (32,000 acre ranch above Lake Cachuma).

2. Threats to Water Quality and Quantity: Water supply for the City of Santa Barbara is located in the Upper Santa Ynez River watershed at Gibraltar Reservoir and the Middle Santa Ynez River watershed at Lake Cachuma. These domestic water sources are "at risk" due to the increase in sediment and large woody debris delivered to the facilities.

Peak flow increases from the fire will also be bulked by ash, debris and other floatable and transportable material within the channel areas. There is a high probability that post-fire flows from the first runoff producing rain events will see a high concentration of ash discharged from the burn area a long distance downstream to the Gibraltar and Cachuma Reservoirs. This has high potential to affect the municipal water supplies in both Cachuma and Gibraltar Reservoirs. The drainage area above Lake Cachuma is a Municipal watershed that supplies drinking water to the entire front country of Santa Barbara County from Carpenteria to Goleta. The total area of watershed burned above Lake Cachuma is about 56%. Of this 36% burned at high and moderate burn severity. The potential for adverse water quality effects, post fire flooding and sediment yield is very high.

There is potential for extremely high increases in sediment yield from the sub watersheds above Gibraltar Lake and the Santa Cruz Creek arm of Cachuma Lake. Sediment yields from these watersheds could increase 10 to 20 fold over the next 5 years as the vegetation in the burned watersheds recover.

All of the sub-watersheds within the burn area are expected to see increased sedimentation that could potentially affect in stream beneficial uses such as cold water fish habitat. Potential for short-term effects on water quality are especially high in the Mono, Santa Cruz, Agua Caliente, Manzana and upper Sisquoc drainages.

Because the majority of the high severity burn area is inaccessible and on slopes exceeding 60%, most of the burned area is too steep and/or rocky to meet the site selection criteria for hillslope treatments and is therefore untreatable. BAER hillslope treatments are not effective or proven on slopes steeper than 60 percent. Unfortunately, these are steep slopes that are most prone to slope failure. No hillslope treatments are generally proposed on moderate burn severity lands for a combination of reasons such as the positive vegetative response in grasslands and shrub communities (see botanist report).

3. Threats to Long Term Soil Productivity: Most soils in this area are shallow to moderately deep with about 3/4 having rock fragments and the other 1/4 having minimal rock fragments. About 80% of the area had slopes greater than 30% and 20% of the area had slopes less than 30%. There are some deep soils that are located on the toe slopes.

Most soils were gravelly fine sandy loams to very gravelly loams. Organic matter destruction was slight and extended down one inch in the hot burned areas. Seed source was present in all soils and natural regeneration should be robust in the spring.

Soil structure was good and soils had good aggregation for stability except in the steep very gravelly loam units that had moderate to high burn severities. In these areas erosion and dry ravel will be elevated for the first year and return to background levels in three to five years.

Cover was lacking for erosion control in the moderate and high burn severity areas due to complete vegetative consumption and no cover recruitment possibilities. These areas are especially pronounced in the Santa Cruz, Mono, and Aqua Caliente Creek watersheds. In other drainages burning was not as intensely hot and resources at risk were not as critical.

Hydrophobicity (water repellency) was only on the soil surface in most areas and on the most part it was fairly discontinuous across the landscape even in hot burned areas. Santa Cruz, Mono, and Aqua Caliente Creek watersheds were the most impacted in the upper headwaters. Lack of water repellency was due to extreme low soil moisture, low relative humidity coupled with finer grained soils of very fine sandy loams to loams.

Dry ravel was observed throughout all inner gorges and was most pronounced in high burn severity areas where shale was present (Santa Cruz, Indian, Santa Barbara, and the upper Sisquoc River).

The soils BAER team did not identify an emergency to the soil resource. The findings in the soils report demonstrate the increased erosion throughout the burned area will be substantial. The high erosion rates are not outside the historic fire regime for Southern California shrublands.

Sediment yield produced by 6th field watersheds burned (1st year)

Soil Analysis Watersheds [1]	Total W/S acreage	% of High & Mod Burn	Post Fire Watershed Erosion Ac-ft	Post Fire Watershed Erosion Tons/acre [2]	Erosion X Normal [3]
East Fork Santa Cruz Creek	20981	87	645	35	194
Middle Santa Cruz Creek	19858	39	286	16	20
Santa Cruz Bay-Combined	**40,839**	**63**	**931**	**26**	**53**
Agua Caliente Canyon	21595	62	714	38	58
Indian Creek	22647	67	729	37	61
Lower Mono Creek	17234	35	299	20	14
Upper Mono Creek	39321	85	1555	45	196
Gibraltar -Combined	**100,797**	**66**	**3297**	**34**	**60**
Santa Barbara Canyon	33256	22	42	1.4	6
Cuyama River/Rancho Nuevo Creek	32236	59	94	4.7	27
Cuyama River-Combined	**65492**	**40**	**136**	**3.4**	**13**
Manzana Creek	36016	28	293	9.3	15
Sisquoc River/Alkali Canyon	29033	14	133	5.2	7
Sisquoc River/South Fork	22226	44	274	14.1	28
Upper Sisquoc River	27956	63	484	19.8	60
Sisquoc-Combined	**115,231**	**36**	**1183**	**11.8**	**21**
Total Affected Watersheds	**322,359**	**45**	**5547**	**20**	**38**

* negligible

[1] HUC 6 watersheds that are in or partially within the fire perimeter.

[2] Average erosion rate for high, moderate, and low burn severity plus unburned portion of watershed outside of burn perimeter.

[3] The values compare pre-fire and post-fire conditions. Example: A 38-fold increase is predicted for the total affected watersheds. Rates for individual 6th field watersheds are listed. Results for combined watersheds are shown as shaded rows.

Erosion Response:

The fire was divided into 5 Soil Analysis Watersheds (see Table above). Each Soil Analysis Watershed has one or more 6th field watersheds that are in or have significant acres within the fire perimeter. Erosion response is calculated by watershed using Rowe, Countryman, and Storey (1949). Post-fire erosion rates vary considerably by watershed depending on the burn severity and how many acres of unburned watershed are outside the fire perimeter. Gibraltar-Combined and Santa Cruz Bay-Combined have the highest erosion rates at 34 and 26 tons/acre, respectively. East Fork Santa Cruz Creek and Upper Mono Creek are the 6th field watersheds with the highest erosion rates at 45 and 35 tons/acre, respectively. At least 85% of these watersheds burned at a high or moderate severity.

4. Threats of Noxious Weeds and Invasive Weed Invasion: Many invasive noxious weeds are known to occur within the Zaca Fire area (Table 1).

Table 1. Invasive Noxious Weeds Known In, and Adjacent to the Zaca Fire Area

Scientific Name	Common Name
Centaurea solstitialis	Yellow Starthistle
Foeniculum vulgare	Wild Fennel
Centaurea maculosa	Tocalote

Tamarix ramossica	Tamarisk
Taeniatherum caput-medusae	Medusahead
Centaurea repens	Russian knapweed
Spartium junceum	Spanish broom
Circium vulgare	Bull Thistle
Cardaria pubescens	Whitetop

Yellow Starthistle is known from both the north and south sides of the Fire. It has been observed along Highway 154, the East Camino Cielo road, the Santa Ynez River, and the Figueroa Mountain Recreational Area.

Wild Fennel is somewhat widespread on the coastal side of the fire. It is found on most of the access routes into the south, west and east sides of the Zaca Fire.

5. **Threats to Wildlife Resources:** Values at risk exist for wildlife species throughout the fire area as a result of the increased potential for noxious, nonnative weed expasion into the fire area. Detrimental impacts that could impede native vegetation recovery such as increased off-highway vehicle access off of Forest system roads into areas denuded of vegetation and stray cattle grazing from adjacent allotments could also affect wildlife species recovery within the burn area. A summary of the BAER Wildlife Report is attached as Appendix D.

   Emergency conditions resulting from the Zaca Fire exist for the following riparian species that will be impacted from increased sediment and high flows:
   - Southern steelhead
   - California red-legged frogs
   - Foothill yellow-legged frog (if extant)
   - Southern pacific pond turtle
   - Two-striped garter snake
   - Arroyo toad

   Emergency conditions resulting from the Zaca Fire exist for the following high elevation conifer species that will have suffered loss habitat:
   - Southern rubber boa
   - Mount Pinos Lodgepole chipmunk
   - California spotted owl

   Emergency conditions exist for the San Diego Horned Lizard because of the loss of habitat and direct mortality from the fire.

6. **Threats to Botanical Resources:** The potential values at risk for sensitive plants are the stability and viability of sensitive plant populations. There are 12 sensitive plants known to occur within the Zaca Fire area. All of these sensitive plants are highly restricted in distribution. There are **no** plants within the Zaca Fire area that are listed as **Federally Threatened or Endangered** with the US Fish & Wildlife Service.

7. **Threats to Heritage Resources:** The Zaca Fire burned in a diverse heritage resource area which includes historic and pre-historic sites including Chumash Rock Art and other cultural deposits. Over 250 recorded sites are located within the burn area. Both erosion events and visitor activities have a high potential to negatively impact heritage sites. A summary of the BAER Archeology Report is attached as Appendix E and an associated Watershed Condition Assessment from the archeology field reconnaissance is attached as Appendix F.

B. Emergency Treatment Objectives:

To protect life and property associated with the public use of the travel routes, hiking trails, and campgrounds within and downslope/downstream of the Zaca Fire, the BAER Assessment Team recommends the temporary, seasonal closure of the burn area to all recreational users. The closures will be accomplished by installing five new gates at strategic locations at route access points outside the fire

perimeter which will effectively close off the burn area when combined with the existing gates present in the area. Short segments of temporary fencing will accompany the gates to help seal-off the entry points. Information boards with closure signs will be installed at the gate locations. Additional closure signs will be installed at strategic route locations leading to the burn area to give users an early advisory of conditions ahead. Patrol and inspect each trailhead for the purpose of making personal contact with forest visitors and to insure physical closure features (i.e. signs, gates, temporary fencing, etc.) are effective and in good repair. The temporary closure of the burn area will also give the burned slopes a chance to establish a vegetative cover without the potential for disturbance by recreation use in the burn area. The burn area closure will allow areas adjacent to archeological sites a chance to revegetative, which will help cover sensitive features and minimize human caused erosion.

The potential for hazardous conditions associated with burnt fiberglass wildlife guzzlers was identified. A summary of the BAER team HAZMAT Report is in Attachment G. Further assessment is needed to determine the extent and degree of risk from these potential sites.

The road and trail surface patrol objective is to improve function to all identified drainage structures and features. Ensure the function of drainage and identify and correct hazards during and after storm events, for risks such as flash flooding, rock fall, debris flow. Actions include cleaning plugged culverts, over-side drains, and trail crossings of ephemeral drainages to prevent stream flow from becoming diverted down the road or trail surface. Minor slump and slide areas would be removed where needed to assure continued operation of drainage facilities. By clearing blockages and restoring drainage function, the road or trail surface should be able to accommodate flows during the next storm. The road and trail segments selected for emergency BAER treatments have reliable access for road and trail crews to meet treatment objectives during the first 180 days (fall and winter).

The archeology treatment objective is to protect two specific rock art sites (visited in the field) from further damage. Replacement of wooden steps and wooden water bars infront of these two sites will help minimize the expected erosion off of the high severity burn surrounding them. A summary of the BAER Archeology Report is in Attachments E and F. Note: Due to the sheer size of this fire and the large number of recorded sites (250), only some of the very highest priority sites were identified to be field assessed within the extended 7 day period for submittal of this report. There is the potential that over the next few months additional high priority archeological sites may be identified as needing BAER emergency treatments. BAER assessment funds will not be used to conduct any further investigations however.

To determine if the fire has enabled the establishment and spread of noxious weeds, and to detect such establishment and spread as early as possible, the BAER team recommends noxious weed detection surveys be conducted. Early detection dramatically increases the likelihood of successful treatment.

The BAER Team recommends maintaining communications with State, County, and Local governmental agencies and adjacent private landowners regarding the inherent watershed reponse to impending precipitation events.

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

Land **N/A** % Channel **N/A** % Roads/Trails **95** % Protection/Safety **95** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	90%	N/A	N/A
Channel	N/A	N/A	N/A

Roads/Trails	90%	90%	90%
Protection/Safety	90%	90%	90%

E. Cost of No-Action (Including Loss): $3,426,000

F. Cost of Selected Alternative (Including Loss): $906,000

G. Skills Represented on Burned-Area Survey Team:

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

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Core Team
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Tim Biddinger (Co-Team Leader, Hydrologist – Tahoe NF)
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Donna Toth (Forest BAER Coordinator – Los Padres NF)
Fletcher Linton (Botanist – Sequoia NF)
Lynee Cavaille (Botanist – Lassen NF)
Dave Lowe (Archaeologist – Private contractor)
Christopher Ruff (Archaeologist – Kaibab NF)
Amy Reid (Archaeologist – Eldorado NF)
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Bob Powell (Engineering – Region 4)
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Bob Jarvis (Engineering – Los Padres NF)
Carolyn Napper (Soils - San Dimas TDC)
Alex Janicki (Soils - Stanislaus NF)
Brad Rust (Soils – Shasta Trinity NF)

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.)

Land Treatments:

Weeds: To determine if the fire has enabled the establishment and spread of noxious weeds, and to detect such establishment and spread as early as possible, the BAER team recommends noxious weed

detection surveys be conducted. Early detection dramatically increases the likelihood of successful treatment. A detailed weed detection survey plan and cost analysis is found in Appendix C attached.

Archeology: Treatment to protect 2 rock art sites will entail replacement of wooden steps and wooden waterbars destroyed by the fire. Refer to Appendix E for a detailed cost description.

HAZMAT: To determine if a hazardous conditions exist from burnt fiberglass wildlife guzzlers, further assessment is needed to ascertain the extent and degree of risk from these potential sites. Refer to Appendix G for a detailed cost description.
Interim 1: The forest has inventoried those guzzlers identified in the Initial Assessment (Appendix G) and have determined that six of the guzzlers were destroyed by the Zaca Fire and need to be removed. See amended Appendix G for costs for this activity.

Channel Treatments: **N/A**

Roads and Trail Treatments:

Roads

1. Improve Drainage Function

Treatment Description: This treatment entails work primarily addressing the capacity of dips that catch surface runoff and direct flows to existing overside drains. The dips need to be enhanced in dimension to handle increased flows and sediment movement. Incidental to this work are activities such as: Clean blockage of drainage ways such as overside drains; removing ruts and gullies and restoring needed inslope or outslope. Improving the existing drainage facilities will insure they are as effective and efficient as possible to handle the anticipated post-burn flows. Refer to Appendix A for a detailed cost description.

2. Emergency Storm Patrol

Treatment Description: Ensure the function of drainage and identify and correct hazards during and after storm events, for risks such as flash flooding, rock fall, debris flow clean up, plugged culverts, and closing gates when warranted. Insure water flow through drainage facilities. Clear blockages to restore drainage function for next storm. Includes minor slump and slide removal where needed to assure continued operation of drainage facilities. Refer to Appendix A for a detailed cost description.

3. Gates/ Administrative Closure

Treatment Description: To mitigate threats to life, property, and/or adjacent resources the BAER Team proposes to use gates with appropriate signage to exclude access supported by a forest order for enforcement. Refer to Appendix A for a detailed cost description.

4. Diversion Prevention Dips

Treatment Description: To mitigate risks for stream diversion and road damage the BAER team proposes the construction of a rolling dip (see drawings). Typical construction involves the use of a dozer and water truck to insure compaction. Refer to Appendix A for a detailed cost description.

Trails

Two areas of concern have been identified for BAER treatments. Prescribed trail treatments will be similar to those prescribed for forest roads, such as improvements to existing water drainage structures to protect the trail infrastructure from failure and increased sediment flow. Four prescribed treatments include:

1. Clearing and improving both earthen and rock water bars,
2. Trail out-sloping and berm removal (as needed),
3. Clear and improve locations on the trails where ephemeral streams cross the tread, and
4. Armor spillways with native materials

BAER treatments will focus on mid-slope trails in areas of moderate to high soil burn severity. No treatments are recommended at major creek crossings or on trails found in major water ways or canyon bottoms. Monitoring points will be established with GPS and photo points to be used over time to check the progress of the recovery efforts. Refer to Appendix B for a detailed cost description.
Interim 1: A third area of concern has been identified for BAER trail treatments. Twenty-two miles of trails on the Mt. Pinos Ranger District were inadvertently left out of the Initial BAER report and effects from the fire will likely result in significant loss or damage to trails and pre-exisitng structures within the burn area. Treatments as described above will also be required on these trails. Please see amended Appendix B for thorough description.

Protection/Safety Treatments: To protect life and property associated with the public use of the travel routes, hiking trails, and campgrounds within and downslope/downstream of the Zaca Fire, the BAER Assessment Team recommends the temporary, seasonal closure of the burn area to all recreational users. The closures will be accomplished by installing five new gates at strategic locations at route access points outside the fire perimeter which will effectively close off the burn area when combined with the existing gates present in the area. Short segments of temporary fencing will accompany the gates to help seal-off the entry points. Information boards with closure signs will be installed at the gate locations. Additional closure signs will be installed at strategic route locations leading to the burn area to give users an early advisory of conditions ahead. Patrol and inspect each trailhead for the purpose of making personal contact with forest visitors and to insure physical closure features (i.e. signs, gates, temporary fencing, etc.) are effective and in good repair. The temporary closure of the burn area will also give the burned slopes a chance to establish a vegetative cover without the potential for disturbance by recreation use in the burn area. Refer to Appendix B for a detailed cost description.

I. Monitoring Narrative:

One person from each of the two districts (SBRD and SLRD) will monitor the BAER treatments to check that signs, information boards, temporary fencing, and gate closures are present and functioning properly to maintain closure integrity. For areas with seasonal closures because of storm events or possible high water flows, the monitor will ensure gates are closed and the area is swept for visitors prior to closure.

Treatment includes maintenance, repair, or replacement of closure features as needed during the closure period (initially 26 weeks). Typical monitoring visits will be two days per week. The frequency of monitoring visits will vary to match the highest period of public use. The highest frequency of use is from today (mid September) until just prior to heavy rains and then tapers off to a lower frequency during winter. Increased user frequency starts back up in March. Monitoring of the gates, information boards, temporary fencing, and trespass prevention into the burn area will occur on a regular basis to maintain closure integrity. Refer to Appendix C for a detailed cost description.

Part VI – Emergency Stabilization Treatments and Source of Funds *Interim # 1*

			NFS Lands				Other Lands			All
Line Items	Units	Unit Cost	# of Units	BAER $	Other $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
Weed Survey:				$0	$0		$0		$0	$0
Salaries	days	1276	30	$38,280	$0		$0		$0	$38,280
PerDiem	days	120	140	$16,800	$0		$0		$0	$16,800
Vehicles	miles	0.37	3,000	$1,110	$0		$0		$0	$1,110
Subtotal Weeds				$56,190						$56,190
Archeology:										
Salaries	days	260	6	$1,560	$0		$0		$0	$1,560
PerDiem	days	50	2	$100	$0		$0		$0	$100
Vehicles	miles	100	0.85	$85	$0		$0		$0	$85
Supplies	total	2250	1	$2,250	$0		$0		$0	$2,250
Subtotal Archeology				$3,995	$0					$3,995
Guzzler Removal:										
Salaries	***days***	***363***	***20***	***$7,260***	***$0***		***$0***		***$0***	***$7,260***
Vehicles	***miles***	***0.5***	***1500***	***$750***	***$0***		***$0***		***$0***	***$750***
Supplies	***total***	***479***	***1***	***$479***	***$0***		***$0***		***$0***	***$479***
Disposal Fees	***total***	***50***	***1***	***$50***	***$0***		***$0***		***$0***	***$50***
Subtotal Guzzler				***$8,539***			***$0***		***$0***	***$8,539***
Subtotal Land Treatments				$68,724	$0		$0		$0	$68,724
B. Channel Treatments										
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
Road Treatments										
Dips	each	1,840	5	$9,200	$0		$0		$0	$9,200
Road Drainage	miles	3,000	32	$96,000	$0		$0		$0	$96,000
Rd Patrol (hand)	days	1,200	20	$24,000	$0		$0		$0	$24,000
Rd Patrol (mechanical)	days	2,500	10	$25,000	$0		$0		$0	$25,000
Subtotal Roads				$154,200						$154,200
Trail Treatments										
Trails - SBRD										
Trail Manager	days	250	5	$1,250	$0		$0		$0	$1,250
Trail Crew (6)	days	185	180	$33,300	$0		$0		$0	$33,300
Trail Supervisor	days	200	30	$6,000	$0		$0		$0	$6,000
Vehicles	miles	0.85	300	$255	$0		$0		$0	$255
Per Diem (7)	days	25	70	$1,750	$0		$0		$0	$1,750
Subtotal Trails SBRD				$42,555						$42,555
Trails - SLRD										
Trail Manager	days	233	30	$6,990	$0		$0		$0	$6,990
Trail Crew (7)	days	1,015	30	$30,450	$0		$0		$0	$30,450
Trail Supervisor	days	200	30	$6,000	$0		$0		$0	$6,000
Vehicles	miles	0.85	300	$255	$0		$0		$0	$255
Logistics	days	233	30	$6,990	$0		$0		$0	$6,990
Subtotal Trails SLRD				$50,685						$50,685
Trails - MPRD										

First Trail Crew (4) and Mobilization	***days***	***1,500***	***20***	***$30,000***	***$0***			***$0***		***$0***	***$30,000***
Mid Season Trail Crew (4) and Mobilization	***days***	***1,500***	***10***	***$15,000***	***$0***			***$0***		***$0***	***$15,000***
End Season Trail crew (4) and Moblization	***days***	***1,500***	***10***	***$15,000***	***$0***			***$0***		***$0***	***$15,000***
Subtotal Trails MPRD				***$60,000***							***$60,000***
Subtotal Road & Trails				$307,440	$0			$0		$0	$307,440
D. Protection/Safety											
Gates	each	8,625	5	$43,125	$0			$0		$0	$43,125
Gate Extension	each	155	40	$6,200	$0			$0		$0	$6,200
Warning Signs	each	1,000	6	$6,000	$0			$0		$0	$6,000
Closure Signs	each	500	32	$16,000	$0			$0		$0	$16,000
Bilingual Handouts & copies	***job***	***1,000***	***1***	***$1,000***	***$0***			***$0***		***$0***	***$1,000***
Information boards	***each***	***500***	***8***	***$4,000***	***$0***			***$0***		***$0***	***$4,000***
Specialist Support	***days***	***350***	***5***	***$1,750***	***$0***			***$0***		***$0***	***$1,750***
Construction/Install Crew	***days***	***250***	***14***	***$3,500***	***$0***			***$0***		***$0***	***$3,500***
Width Limiter	***each***	***2,500***	***2***	***$5,000***	***$0***			***$0***		***$0***	***$5,000***
Subtotal Structures				$86,575	$0						$86,575
E. BAER Evaluation											
Salaries	days	450	323	$145,350	$0			$0		$0	$145,350
PerDiem	days	215	174	$37,410	$0			$0		$0	$37,410
Travel - land	miles	0.5	22,708	$11,354	$0			$0		$0	$11,354
Travel - air	flights	2,410	3	$7,230	$0			$0		$0	$7,230
Rm Rental/Supplies	all	2,350	1	$2,350	$0			$0		$0	$2,350
Subtotal Assessment				$203,694							$203,694
BAER Implement.											
BAER Impl. Leader	days	340	60	$20,400	$0			$0		$0	$20,400
BAER Coord.	days	420	40	$16,800	$0			$0		$0	$16,800
Subtotal Implementation				$37,200							$37,200
Subtotal Evaluation				**$240,894**	$0			$0		$0	$240,894
F. Monitoring											
Trails - SBRD											
Patrol Closure	days	200	104	$20,800	$0			$0		$0	$20,800
Project Manager	days	300	5	$1,500	$0			$0		$0	$1,500
Repair Materials	item	500	1	$500	$0			$0		$0	$500
Trails - SLRD											
Patrol Closure	days	200	104	$20,800	$0			$0		$0	$20,800
Project Manager	days	300	5	$1,500	$0			$0		$0	$1,500
Repair Materials	days	500	1	$500	$0			$0		$0	$500
Trails - MPRD											
Patrol/Monitor Closure	***days***	***250***	***52***	***$13,000***	***$0***			***$0***		***$0***	***$13,000***
Project Manager	***days***	***325***	***5***	***$1,625***	***$0***			***$0***		***$0***	***$1,625***
Subtotal Monitoring				$60,225	$0						$60,225
G. Totals				$763,858	$0			**$0**		**$0**	$763,858
Previously approved				$665,444							
Total for this request				***$98,414***							

PART VII - APPROVALS

1. /s/ Kenneth E. Heffner — 9/17/07

Kenneth E. Heffner
Acting Forest Supervisor (signature) Date

2. _____ _____

Regional Forester (signature) Date

APPENDIX A

TECHNICAL SPECIALIST'S REPORT – BURNED AREA EMERGENCY RESPONSE

Resource: Engineering
Fire Name: Zaca Month/Year: September/2007

Author Name(s), Title(s), Duty Station(s):

Robert H. Powell, PE
Transportation Engineer
USFS Region 4 Regional Office

Greg Napper
Civil Engineer
San Dimas Technology and Development Center

Rusty LeBlanc
Civil Engineering Technician
Stanislaus National Forest

Resource Condition Assessment

A. Resource Setting

There are approximately 90.0 miles of Forest Service roadway within the fire perimeter, with additional mileage which may be affected by the fire below burned watersheds.

Initial Concerns

Risk of increased runoff and sedimentation resulting in downstream impacts to life and property.

Risk of loss of roadway improvements including road drainage structures, surfacing, and the roadway structure itself.

Effects of roadways causing concentration of increased water flows during storm events, leading to increased sediment transport to streams.

Maintaining access to recreation opportunities and commercial enterprises.

Flood Threats

BAER authority provides funds to treat road and trail systems to prevent emergency conditions due to potential floods and increased overland runoff due to fire effects on watersheds. Burned watersheds can deliver more runoff than drainage structures are able to safely pass. In most road and trail systems the drainages are designed to pass pure water, without any allowance for sediments, floatable debris, or rocks. The threats caused by a fire are excessive runoff, suspended solids in the runoff, and floatable debris.

The road prism may also be at risk from excessive runoff, especially where the road or trail is cut into the hill slope and the prism is an in-sloped design. The burned hillsides can deliver excessive overland runoff and release large and small rocks that were previously held in place by vegetation that no longer exists. These conditions can threaten the road and road users. The road prism is usually not threatened by precipitation that falls directly on the prism surface, because the fire usually does not change the hydrology of the surface.

Findings of the Ground Survey

The Zaca fire burned approximately 240,200 acres during July and August of 2007.

Of this acreage, burn severity was determined to be 14 percent high, 54 percent moderate, and 32 percent low/unburned. The affects of the fire are diminished ground cover and vegetation. The condition is expected to result in increased, flashy runoff; down slope movement of fine ash and sediment, rock fall, and debris flows until vegetation is reestablished. This is especially true in the 14 percent of the area which has high burn severity.

Fire area maps were consulted and roads within and adjacent to the fire perimeter were driven in order to determine an initial assessment as to which associated roads held the highest potential for fire related flood and debris damage.

Roads within the burn are located in steep terrain with slopes up to 100%. When the roads do occasionally cross the slope, concerns for user safety require the use of berms to define a safe road edge to prevent rollover accidents. This road design element results in a hydrologic channel for rainfall and overland flow. Steep gradients in these same locations magnify the effects and erosive power of overland flow. Burned areas above roads increases and magnifies again runoff effects on the road surface and in the drainages. In concave topography roads typically have design elements that focus drainage into existing ephemeral channels on the hill slope. This is done with dips that direct water to over side drains. Roads located on the ridges require few drainage structures and usually can be drained with lead out ditches. Stream crossings in this terrain are typically natural fords. In convex topography the intent of design is to carry water and overland flow to the main drainages. In both cases there are exceptions where water has been directed from the road surface onto hill slopes and have created gullies. The road resource in the burned area is generally considered to be low risk due primarily to the fact that there are no culverts. However the need to capture and carry rainfall and runoff on the road surface for long distances, dictated by safety concerns and designed to be compatible with hill slope hydrology, carries with it additional risk when subject to the changed hydrologic response following a burn**.**

Much of the fire area which comprised the BAER Assessment burned on ground that was either in or adjacent to the Dick Smith and San Rafael Wilderness Areas. Within these areas no roads are present. There is, however, a road that separates these two wilderness areas. This is the Buckhorn Road # 9N11. This road provides critical administrative and fire access to large acreages of the forest and is the main value at risk identified by the engineers.

In the roaded areas that burned, many roads were ridge-top roads known locally as “jeep ways” which are closed to all but administrative traffic and would feel no effects from increased fire runoff. Most other roads in the area are also located on the ridge tops and make up much of the fire perimeter.

There is one roadway within the fire perimeter that did not appear on the forest road system list. This road is the Manzana Schoolhouse road. Apparently, this roadway was originally constructed as access to private land in the bottom of the drainage and has never been officially added to the forest road system, even though it is almost entirely located on National Forest land. The private land owner (Mr. Cody) was contacted and he indicated that he was the primary maintainer of the road. The BAER team engineers were unable to determine if there was a road use or special use permit issued on this road and thus we were unable to determine maintenance jurisdiction
The accessible portion of the Buckhorn Road and other roads were driven and an engineering assessment was made as to the potential for fire related damage. The on the ground engineering assessment and consultation with other BAER Team members enabled a determination of values at risk, and treatments that fit within the

framework of the BAER authority. Treatments then were described in terms of work items and cost estimates were made in preparation for contract award and implementation.

General work items identified for roads include the enhancement of drainage structures to handle increased flows; gate installation and signing to efficiently close areas to insure public safety, and after storm patrols to keep the roadway drainages functioning through the first critical wet season.

Of the 90.0 miles of road identified by GIS as being within the fire perimeter, we found 4.9 miles to be on ridgelines as fire perimeter roads, 49.2 miles are ridge top "jeep ways", 32.9 miles constituting the Buckhorn Road and its adjacent roadways, and 3.0 miles of access road in the Rancho Nuevo area. All perimeter roads and "jeep ways" were determined not to be at risk as well as the roads outside the burn perimeter in the Zaca, Agua Caliente, and Mono drainages which are currently serviced by hardened low water crossings.

It is anticipated that there will be considerable material movement in the form of raveling, rock fall, falling snags, and overland flow within the burn area especially during the first winter rainy season. Because of these conditions, it is recommended that the area be closed at least during rain events if not seasonally to keep the public out of the area for safety reasons. This would be accomplished by the use of gates and signs.

Please refer to the "Watershed Report" for specific terrain, soil type, burn severity, and area specific information which was considered and is pertinent to the engineering decisions made for selected roads.

B. Summary of findings after on-the-ground survey

1. Values at Risk

Values at risk from roads subject to increased runoff are:

a. Threat to Infrastructure (road damage…loss of investment)
b. Threat to life (Flooding on roads occupied by road users, washouts as a road hazard, users entrapped by washouts)

2. Describe Condition of Values at Risk.

Many of the drainage structures on roads in the burn are functional but not operating at full design capability. Most of these structures need the attendant water bars reinforced, drain inlets cleaned, and in some cases additional backup structures installed in order to insure that they prevent road damage and eliminate the potential threats to human life. This will be especially important for the upcoming rainy season this winter. The roadway surface is for the most part in reasonable shape.

II. Emergency Determinations –

The Buckhorn Road (9N11) was identified as the main asset at risk by the engineers. Only the lower half of the road from the fire perimeter above Upper Oso Campground to Bluff Camp was accessible due to rock fall and fallen snags. On this portion we found the original design to be based on a drainage system consisting dips leading to over-side metal drains and berms. 82 such structures were counted between the south fire perimeter and Bluff Camp. This portion of the road is viewed as typical for the entire roadway located within the burn perimeter. Improving the capacity of these structures to handle increased runoff due to the fire is viewed as critical to preserving this asset.

In the Rancho Nuevo area, roads 7N04 and 7N04A have several culverts which will most likely be adequate for anticipated flows, however it may be prudent to utilize dips to catch any overflow caused by high rain events.

The Manzana Schoolhouse Road, while not presently a part of the forest road inventory, it is located almost entirely on National Forest System Lands. This road was determined to be at risk due to the presence of road crossing sites with stream diversion potential. These sites if not treated could incur damage well beyond the cost of prevention treatments.

The other critical value at risk is the safety of the public. It is recommended that the area be closed to public use either during rain events this winter, or generally closed throughout the winter.

III. Treatments to mitigate the emergency

Treatment Type (including monitoring if applicable)	**Road Closure**
Treatment Objective	Prevent exposure to hazards due to flooding and road damage
Treatment Description	Install gates and Closure signage
Treatment Cost	$8,625 each and $300 each

Treatment Type (including monitoring if applicable)	**Road Drainage Improvement**
Treatment Objective	Control increased runoff due to fire
Treatment Description	Improve and increase the size of drainage structure capacity to handle increased flows. This includes enhancing existing dips.
Treatment Cost	$3,000/mile

Treatment Type (including monitoring if applicable)	**Dips**
Treatment Objective	Prevent stream diversion
Treatment Description	Construct drivable dips (see drawings)
Treatment Cost	$1,840 each

Treatment Type (including monitoring if applicable)	**Road Patrol**
Treatment Objective	Insure proper functioning of drainage throughout the winter weather
Treatment Description	1. Pickup and shovel patrol 2. Grader and swamper patrol
Treatment Cost	1. $1,200/day 2. $2,500/day

	NFS Lands				
Line Items	Units	Unit Cost $	Number of Units	FFFS-FW22 $	Other $
					ident.
Dips (to prevent stream diversion)	Each	$1,840	5	$9,200.00	
Gates **GateExtend**	Each L.F.	$8,625 $155	5 40	$43,125.00 $6,200.00	
Improve Road Drainage	Mile	$3,000	32	$96,000.00	
Road Patrol (Hand)	Day	$1,200	20	$24,000.00	
Road Patrol (Machine)	Day	$2,500	10	$25,000.00	
Signs (Warning)	Each	$1,000	6	$6,000.00	
Signs (Closure)	Each	$500	32	$16,000.00	
Totals				**$225,525.00**	

*Cost includes vehicle use, contract administration and specialist support for ground disturbing activities.

IV. Discussion/Summary/Recommendations – Discuss or summarize as desired.

The engineering team was not able to survey all of the roads in the burn due to time constraints, rockfall and down snags. We recommend further surveys to validate initial assessments and estimates.

V. References – Document references used in your analysis

FSH 2509.13 Chapter 20
FSH 2509.13 Chapter 40
Los Padres National Forest INFRA Travel Routes Inventories
Consultation with Bob Jarvis, Forest Transportation Manager

VI. Appendices – Attach materials not in body of report

Power Point Presentation (available as electronic file)
Treatment Prescriptions (below)

Treatment Prescriptions

Improve Drainage Function

Treatment Objective: Improve function to all identified drainage structures and features.

Treatment Description: This treatment entails work primarily addressing the capacity of dips that catch surface runoff and direct flows to existing overside drains. The dips need to be enhanced in dimension to handle increased flows and sediment movement. Incidental to this work are activities such as: Clean blockage of drainage ways such as overside drains; removing ruts and gullies and restoring needed inslope or outslope. Improving the existing drainage facilities will insure they are as effective and efficient as possible to handle the anticipated post-burn flows.

Treatment Cost: Highly variable, but estimate at approximately $3,000 per mile.

Emergency Storm Patrol

Treatment Objective: Ensure the function of drainage and identify and correct hazards during and after storm events, for risks such as flash flooding, rock fall, debris flow clean up, plugged culverts, and closing gates when warranted. Insure water flow through drainage facilities. Clear blockages to restore drainage function for next storm. Includes minor slump and slide removal where needed to assure continued operation of drainage facilities.

Treatment Cost: Varies with storm event, but can be expected to run approximately $2,500 per day when equipment is required and $1,200/day for a shovel patrol, depending on the storm event, action taken, labor and equipment used, and amount of clean up needed.

Gates/ Administrative Closure

Treatment Objective: To mitigate threats to life, property, and/or adjacent resources.

Treatment Description: This treatment includes the use of gates with appropriate signage to exclude access supported by a forest order for enforcement.

Treatment Cost: Highly variable, depending on the nature of the physical barrier. Costs could range up to $8,625 for a traffic gate, $500 for closure signs and $1,000 for Warning Signs.

Diversion Prevention Dips

Treatment Objective: To mitigate risks for stream diversion and road damage.

Treatment Description: This treatment entails the construction of a rolling dip (see drawings). Typical construction involves the use of a dozer and water truck to insure compaction.

Treatment Cost: Highly variable, depending on the road grade. Costs could range up to $1,840 per site.

Santa Barbara RD and Santa Lucia RD Trail Assessment

Emergency Trail Treatments:

An emergency determination has been made that the fire will likely cause significant loss or damage to the trails and pre-existing structures on both the Santa Barbara RD (SBRD) and the Santa Lucia RD (SLRD). Additionally, both districts recently completed Capital Investment Projects (CIP). The SBRD recently completed the Santa Cruz Trail CIP, a multi-phased regionally funded project, implemented during 2005-2007, with a total project investment of $151,000. The SLRD recently completed both the Judell Trail CIP (2007) and the Sweetwater Trail CIP (2005) both multi-phased regionally funded projects, with a total project investment of $380,000. The fire will likely cause significant loss of these investments. The Santa Cruz Trail is a congressionally nominated National Recreation Trail. The mid-slope segments of the Grapevine (SBRD), Sulphur Springs (SLRD), and Potrero Canyon (SLRD) trails have also received on-going regular maintenance regime of water control structure installation and water bar maintenance.

Trail Structure Treatment Objectives: Minimize risk of trail failure through the placement and maintenance of effective erosion structures. Ensure integrity and protection of trails in the burn area. The trail segments selected for emergency BAER treatments have reliable access for trail crews to meet treatment objectives during the first 180 days (fall and winter).

Treatment Description: Two trail segments of concern have been identified on the SBRD and four trail segments on the SLRD have been identified for BAER treatments. Prescribed trail treatments will be similar to those prescribed for forest roads, such as improvements to existing water drainage structures to protect the trail infrastructure from failure and increased sediment flow. Four prescribed treatments include:

- Clearing and improving both earthen and rock water bars,
- Trail out-sloping and berm removal (as needed),
- Clear and improve locations on the trails where ephemeral streams cross the tread, and
- Armor spillways with native materials, if needed.

BAER treatments will focus on mid-slope trails in areas of moderate to high soil burn severity. No treatments are recommended at major creek crossings or on trails found in major water ways or canyon bottoms. Monitoring points will be established with GPS and photo points to be used over time to check the progress of the recovery efforts.

Santa Barbara RD: A seven person trail crew composed of a combination of District fire and recreation personnel will complete the emergency treatments. Work will consist of day work and short overnight stays to access the trail areas. Work will be on the two trail segments identified above. The Santa Cruz Trail (27W09) treatments will occur from Alexander Saddle north to the wilderness boundary for a total of approximately 7 miles. The second trail is the Grapevine Trail (27W10) in the San Rafael wilderness; treatments will be from Bluff Camp west to the Santa Cruz trail for approximately 6 miles.
It is anticipated to take six 5 day tours to accomplish the BAER emergency treatments. Initially, this crew will concentrate in opening and armoring all existing drainage features prior to the first major rain events. Mid-season, a second visit will be completed to clean sedimentation out of drainage structures after rain events. A final entry will be conducted at the end of rainy season in preparation for the following winter.

Santa Lucia RD: A seven person trail crew composed of a combination of District fire and recreation personnel will complete the emergency treatments. Work will consist of day work and short overnight stays to access the trail areas. Work will be on the four trail segments identified above. On the Sulphur Springs Trail (30W07), treatments will occur on 3 miles of trail with approximately 8 stream crossings. The second trail is the Potrero Canyon Trail (29W12) with treatments on 3.5 miles of trail with approximately 8 stream crossings. The third trail is the Judell Trail (26W05) with treatments on 6 miles with approximately 15 stream crossings of concern. The fourth and final trail is the Sweetwater Trail (27W06) with treatments on 7 miles with approximately 8 stream crossings of concern.

Initially, this crew will concentrate in opening and armoring all existing drainage features prior to the first major rain events. Mid-season, a second visit will be completed to clean sedimentation out of drainage structures after rain events. A final entry will be conducted at the end of rainy season in preparation for the following winter.

Access to the Sulphur Springs Trail is by way of the native surfaced Zaca Road and hence operations will be done before the rainy season and/or during dry periods. The Potrero Canyon Trail is accessed by the paved Sunset Valley road and therefore access is year-round. The Judell and Sweetwater trails are accessed by the Sierra Madre Road and the Santa Barbara Canyon Road (both native surfaced) and hence operations will be done before the rainy season and/or during dry periods.

Treatment Costs:

Santa Barbara RD

Line Item	Units	Unit Costs	Total Funding
GS-9 Trail Manager	5 days	$250 / day	$ 1,200
Trail Crew GS-5 (6)	30 days	$185 / day	$33,300
Trail Supervisor GS-7 (1)	30 days	$200 /day	$ 6,000
FOR rate for vehicles	300 miles	$.85 / mile	$ 255
Backcountry per diem	(7) Crew	$25 / day x 10 days	$ 1,750
Total			$42,590

Santa Lucia RD

GS-9 Trail Manager	30 days	$233.33 / day	$ 7,000
Trail Crew (7)	30 days	$145 / day	$30,450
GS-7 Trail Supervisor	30 days	$200 /day	$ 6,000
FOR rate for vehicles	300 miles	$.85 / mile	$ 255
Logistical Support	30 days	$233.33 / day	$ 7,000
Total			$50,705

Total for both Districts **$93,295**

Emergency Treatments: Closure Monitoring and Patrol

Treatment Objectives: Ensure physical closure features (i.e. signs, temporary fencing, etc.) are effective. Repair and post as needed. Patrol and inspect each trailhead twice a week for the purpose of making personal contact with forest visitors.

Treatment Description: One person from each of the two districts (SBRD and SLRD) will monitor the BAER treatments to check that signs, information boards, temporary fencing, and gate closures are present and functioning properly to maintain closure integrity. For areas with seasonal closures because of storm events or possible high water flows, the monitor will ensure gates are closed and the area is swept for visitors prior to closure.

Treatment includes maintenance, repair, or replacement of closure features as needed during the closure period (initially 26 weeks). Typical monitoring visits will be two days per week. The frequency of monitoring visits will vary to match the highest period of public use. The highest frequency of use is from today (mid September) until just prior to heavy rains and then tapers off to a lower frequency during winter. Increased user frequency starts back up in March. Monitoring of the gates, information boards, temporary fencing and trespass prevention into the burn area will occur on a regular basis to maintain closure integrity.

Treatment Costs:
(over a 26 week monitoring period) for both districts (SBRD and SLRD)

Line Item	Units	Unit Costs	Total Funding
GS-5 Recreation Tech. (1)	104 days	$200 / day	$20,800
GS-11 Program Mgr. (1)	5 days	$300 / day	$ 1,500
Maintenance materials	1	$600	$ 600
SubTotal			$22,800/district
TOTAL for both districts (SLRD & SBRD)			**$45,600**

Interim #1:

Mount Pinos RD Trail Assessment

Emergency Trail Treatments:

Approximately 27 miles (gross mileage) of MPRD administered trails are within the Zaca Fire burn area. Of that mileage, approximately five miles of trails have been previously identified in the Santa Lucia assessment (Judell and Sweetwater Trails). This assessment addresses the remaining 22 miles of trail.

An emergency determination has been made that the fire will likely cause significant loss or damage to trails and pre-existing structures within the burn area. Two treatments have been identified to mitigate the potential damage impacts and assist with protecting life adjacent to the burn area.

1) Trail and Trail Structure Treatment Objectives: Minimize risk of trail failure through the placement and maintenance of effective erosion structures. Ensure integrity and protection of trails in the burn area. The trail segments selected for emergency BAER treatments have reliable access for trail crews to meet treatment objectives during the first 180 days (fall and winter).

Five trails of concern have been identified in the fire area. Prescribed trail treatments will be similar to those prescribed for forest roads, such as improvements to existing water drainage structures to protect the trail infrastructure from failure and increased sediment flow. Five prescribed treatments include:

- ***Clearing and improving erosion control features such as water bars,***
- ***Trail out-sloping and berm removal as needed,***
- ***Clear and improve locations on trails where ephemeral streams cross the tread,***
- ***Armor spillways with native materials if needed, and***
- ***Install two width limiters on 7N04 Tinta OHV MotorcycleTrail.***

Extensive BAER treatments will focus on mid-slope trails in areas of moderate to high soil burn severity. Only minor treatments such as maintenance/clearing of erosion control features are recommended in canyon bottoms in preparation for episodes of winter runoff. No treatments are recommended at major creek crossings or on trails found in major water ways.

All trails will receive a cursory field survey to include establishment of monitoring points (GPS of photo points) to be used over time to check the effectiveness of BAER treatments and progress of recovery efforts.

An experienced four person trail crew (plus mobilization costs) will concentrate on opening and armoring all existing drainage features prior to the first major rain events. Additionally, they will establish and GPS monitoring points within the burn area. This work is anticipated to take 20 days.

Mid-season, a second visit will be completed to clean sedimentation out of drainage structures after rain events and take photos of monitoring points. Canyon bottom segments of trails will be checked at this time for damage. This work is anticipated to take 10-20 days depending upon the intensity and/or impact of the rain event(s).

Funding for a final entry is requested at the end of the rainy season (typically May) for the same purposes as the mid-season visit. Repair of canyon bottom trail segments may be needed at this time to safely open the area to the public. This work is anticipated to take 10-20 days depending upon the intensity and/or impact of the rain event(s).

Treatment Costs:

Line Item	*Units*	*Unit Costs*	*Total Funding*
Initial 4 Person Trail Crew	*20 days*	*$1500/day*	*$30,000*
Mid Season Trail Crew	*10 days*	*$1500/day*	*$15,000*
End Season Trail Crew	*10 days*	*$1500/day*	*$15,000*
Sub-Total for MPRD			*$60,000*

2) Emergency Closure Monitoring and Patrol

Treatment Objectives: Ensure physical closure features (i.e. signs, temporary fencing, etc.) are effective. Repair and post information as needed. Patrol and inspect each trailhead twice a week for the purpose of making personal contact with forest visitors.

Treatment Description: Funding is requested to ensure signs, information boards, temporary fencing, and gate closures are functional and properly maintained to ensure closure integrity.

Treatment includes manufacture and installation of two width limiters on 7N04 Tinta Motorcycle Trail; construction and installation of eight information boards at closure locations; development of bilingual handouts regarding the closure; laminating supplies and paper for closure order/handout postings; specialist salary for installation approvals; and installation/repair of fence line as needed. Monitor will visit each closure point weekly at a minimum. Funding is requested to cover two days a week for 26 weeks to cover travel and work time needs.

Treatment Costs:

Line Item	*Units*	*Unit Costs*	*Total Funding*
Bilingual Handout & Copies	*1*	*$1000 job*	*$ 1,000*
Const/Install Crew	*14*	*$250/day*	*$ 3,500*
GS-11 Program Mgr	*5*	*$325/day*	*$ 1,625*
Information Boards	*8*	*$500/each*	*$ 4,000*
Width Limiter	*2*	*$2500/each*	*$ 5,000*
Monitor	*52*	*$250/day*	*$13,000*
Specialist Support	*5*	*$350/day*	*$ 1,750*
Sub-Total for MPRD			*$29,875*
GRAND TOTAL for MPRD			*$89,875*

BAER SURVEY SPECIALIST REPORT

Resource Specialty: **Noxious Invasive Weeds**
Fire Name: Zaca Fire
Month and Year: July, August, & September, 2007
Prepared by: Fletcher Linton, Forest Botanist, Sequoia National Forest (NF) &
Lynée Cavaille, Assistant Forest Botanist, Lassen NF
Technical Consultation Provided by: Lloyd Simpson, Forest Botanist, Los Padres NF

I. Potential Values at Risk

The Zaca Fire burned within the south-central portion of the Los Padres NF on the Mt Pinos, Santa Lucia, and Santa Barbara Ranger Districts. A number of private in-holdings within the forest were also burned. The fire burned during the months of July and August, 2007 and affected just over 240,000 acres.

Many non-native plants are found in California wildlands, but some are much more invasive and noxious than others. Noxious weeds have spiny or sharp parts which can be hazardous or annoying to humans and livestock. Invasive weeds are very effective at occupying disturbed soil and displacing native plants and habitat. Non-native invasive weeds have the potential to displace native vegetation, degrade habitat function, and lower ecosystem stability. Ecological stability relates to the value of native plant communities for wildlife habitat and watershed function.

The potential values at risk, in relation to invasive noxious weeds are the ecological stability of native plant communities and the degradation of Region 5 Sensitive plant habitat. Not unlike the large Day Fire in 2006, the Zaca Fire impacted an enormous variety of different plant communities and environments. It burned from Coastal Sage Scrub to Great Basin Sagebrush and from Big-Cone Douglas-fir Forest to Pinyon Pine Woodland. The plant communities found within the fire area are:

- Coastal Sage Scrub
- Oak Savanna
- Chaparral (Mesic, Xeric and Semi-Desert)
- Upland Oak Forest
- Coulter Pine Woodland
- Big-Cone Douglas-fir Forest
- Jeffery, Ponderosa, and Sugar Pine Forest
- Sargent Cypress Woodland
- Pinyon Pine Woodland

The R5 Sensitive Plants with potential to be affected by noxious weeds are:

- Mount Pinos onion (*Allium howellii var. clokeyi*)
- Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*
- late-flowering mariposa lily (*Calochortus weedii* var. *vestus*)
- Santa Barbara jewel-flower (*Caulanthus amplexicaulis* var. *Barbara*)
- Blakley's spineflower (*Chorizanthe blakleyi*)
- umbrella larkspur (*Delphinium umbraculorum*)
- Fort Tejon woolly sunflower (*Eriophyllum lanatum* var.*hallii*)
- pale-yellow layia (*Layia heterotricha*)
- Carmel Valley malacothrix (*Malacothrix saxatilis* var. *arachnoidea*)
- Baja navarretia (*Navarretia peninsularis*)
- Parish's checkerbloom (*Sidalcea hickmanii* ssp. *Parishii*)
- southern jewel-flower (*Streptanthus campestris*)
- Santa Ynez false lupine (*Thermopsis macrophylla*)

Additionally, the upper Santa Ynez River and the middle Sisquoc River are identified as "Areas of High Ecological Significance" in the 'Southern California Mountains and Foothill Assessment' (Stephenson & Calcarone, 1999).

II. Resource Condition Assessment

A. Resource Setting

Many invasive noxious weeds are known to occur within the Zaca Fire area (Table 1).

Table 1. Invasive Noxious Weeds Known In, and Adjacent to the Zaca Fire Area

Scientific Name	Common Name
Centaurea solstitialis	Yellow Starthistle
Foeniculum vulgare	Wild Fennel
Centaurea maculosa	Tocalote
Tamarix ramossica	Tamarisk
Taeniatherum caput-medusae	Medusahead
Centaurea repens	Russian knapweed
Spartium junceum	Spanish broom
Circium vulgare	Bull Thistle
Cardaria pubescens	Whitetop

Short species summaries for each of these weeds are located in Appendix a.

Yellow Starthistle is known from both the north and south sides of the Fire. It has been observed along Highway 154, the east Camino Cielo road, the Santa Ynez River, and the Figueroa Mountain Area.

Wild Fennel is somewhat widespread on the coastal side of the fire. It is found on most of the access routes into the south, west and east sides of the Zaca fire.

Tocalote is also known from across the south side of the fire area in disturbed grassland and chaparral.

Tamarisk occurs sporadically in the both the Sisquoc and Santa Ynez rives drainages. White Top is found along Hwy 33 as scattered colonies on dry roadsides in the Sespe Creek watershed along Hwy 33

Medusahead is known from the north side of the Zaca fire in Salisbury Potrero and Montgomery Potrero.

Russian knapweed is found along Sierra Madre Rd at Lyon Canyon and on private land in lower Newsome Canyon on the north side of the fire.

Spanish Broom is a known problem along the western portion of East Camino Cielo (5N12). It is also known from the upper part of the Fremont fuelbreak. Spanish broom is also found along Highway 33, from Wheeler Gorge to approximately one mile north of Sespe Gorge.

Bull Thistle is a weed of wet areas that is known from both the Santa Lucia and Mt. Pinos sections of the fire area.

B. Findings of the On-The-Ground Survey

1. Resource condition resulting from the fire

During fire suppression activities, 43 drop points, 34 safety zones, and approximately 329 miles of dozer lines, were constructed or reestablished during fire suppression activities. In addition, there are 397 miles of roads within the fire which could also serve to disperse weed seeds. Dozer lines, drop points, and safety zones serve as weed dispersal areas or corridors and suppression equipment can act as weed vectors. Movement of fire suppression and rehab equipment can disperse and spread noxious weeds to and from areas within the fire and among home units. Dispersal of weeds from fire equipment movement poses a significant risk to post-fire regeneration. Roadsides and dozer lines will be most impacted by this threat.

Forest Service policy requires washing of all equipment mobilizing onto wildfires, to prevent the introduction of noxious weeds into the burned area during suppression activities. Because of the extended duration of this fire and the extreme fire behavior some shifts and equipment were not washed during mobilization. Equipment such as tankers, engines, dozers, and excavators were not washed or inspected or cleaned for dirt/plant parts on the way into the fire during suppression and rehabilitation efforts. Because of this, we have no way of knowing if invasive noxious weed seeds were introduced to roadsides and dozer lines within the fire area. Additionally, crews working on the fire were brought in from other areas known to have other potential non-native invasive weed problems.

During the BAER team limited survey, noxious weed populations were confirmed or discovered in the following areas:

Yellow Starthistle – East Camino Cielo (5N12) between Highway 154 and Romero Saddle, Camuesa Road (5N15), Happy Canyon Road (7N07), Camuesa Road (5N15)
Tocalote – East Camino Cielo (5N12), Camuesa Road (5N15), Agua Caliente Canyon (5N16), Camuesa Road (5N15)

Fennel – Highway 33, East Camino Cielo (5N12), Happy Canyon Road (7N07)

Spanish Broom – Highway 33, East Camino Cielo (5N12)

No other invasive noxious weed populations were observed within the burn area or along the access roads outside of the burn area. Existing weed populations could have been present within the burned area, but because of the time of year (late summer) and the recent fire, evidence wasn't easily observable.

2. Consequences of the fire on values at risk

If any weeds were introduced, they could take advantage of the disturbance associated with the fire and displace native vegetation, degrade habitat function, lower ecosystem stability.

III. Emergency Determination

The unknowing introduction of invasive noxious weeds into areas disturbed by fire suppression and rehabilitation has the potential to establish persistent weed populations. These persistent populations could affect the structure and habitat function of plant communities within the burn area. Forest Service direction is to minimize the establishment of non-native invasive species to prevent unacceptable degradation of the burned area. Consequently, delayed assessment of roads, dozer lines, drop points, and safety zones is necessary to detect the spread and introduction of weeds in the first year after fire. Assessing the establishment of weeds and treating small outlying populations before they expand, will prevent the weeds from becoming serious threats to the recovery of native plants.

I. IV. Treatments to Mitigate the Emergency

ALL PRIORTIES OPTION

A. Treatment Type
The treatment is noxious weed detection surveys of all roads, dozer lines, drop points, and safety zones affected by the Zaca fire. These areas will be surveyed for evidence of introduction or spread of noxious weeds. If any new or outlying populations are found in these surveys, a supplementary request for noxious weed treatment will be submitted.

B. Treatment Objective
Evaluate and eliminate the potential for noxious invasive weed establishment and spread, in all areas affected by the Zaca fire suppression activities.

C. Treatment Description

Inspect all areas and monitor for newly established weed occurrences. Monitoring will include documentation and hand pulling small new weed occurrences at the time of inspection. New weed occurrences will be pulled to root depth, placed in sealed plastics bags, and properly disposed.

Documentation of new infestations will include:

- GPS negative and positive inspection results
- Incorporate data into GIS spatial database
- Establish photo points
- Map perimeter of new infestation
- Estimate number of plants per square meter
- Treatment method
- Dates of treatment
- Evaluate success in subsequent inspection

Inspections and monitoring should be accomplished during May/June 2008. Based upon the first year's survey, additional surveying may be requested for up to three years. BAER funding is only requested for the first year after fire.

D. Treatment Cost – All Priorities Options

GS –11 Botanist	$485/day x 20 days =	$9,700
GS – 7 Bio Tech Crew Leader	$277/day x 3 pay periods (30 days) =	$8,310
GS – 5 Bio Tech	$225/day x 3 pay periods (30 days) =	$6,750
GS – 5 Bio Tech	$225/day x 3 pay periods (30 days) =	$6,750
GS – 5 Bio Tech	$225/day x 3 pay periods (30 days) =	$6,750
Mileage:	3,000 miles @ 0.37/mile =	$1,110
Lodging:	$60/day x 140 days	$8,400
Per Diem:	$60/day x 140 days	$8,400
	Total Cost Estimate for FY 2008 =	**$56,170**

HIGHEST PRIORTIES OPTION

A. Treatment Type
The treatment is noxious weed detection surveys of selected roads, dozer lines, drop points, and safety zones affected by the Zaca fire. These targeted high priority areas will be surveyed for evidence of introduction or spread of noxious weeds. If any new or outlying populations are found in these surveys, a supplementary request for noxious weed treatment will be submitted.

B. Treatment Objective
Evaluate and eliminate the potential for noxious invasive weed establishment and spread, in selected high priority affected by the Zaca fire suppression activities.

C. Treatment Description
Inspect selected areas and monitor for newly established weed occurrences. Monitoring will include documentation and hand pulling small new weed occurrences at the time of inspection. New weed occurrences will be pulled to root depth, placed in sealed plastics bags, and properly disposed.

Documentation of new infestations will include:

- GPS negative and positive inspection results
- Incorporate data into GIS spatial database
- Establish photo points
- Map perimeter of new infestation

- Estimate number of plants per square meter
- Treatment method
- Dates of treatment
- Evaluate success in subsequent inspection

Inspections and monitoring should be accomplished during May/June 2008. Based upon the first year's survey, additional surveying may be requested for up to three years. BAER funding is only requested for the first year after fire. Appendix b shows the areas identified for the highest priority survey.

D. Treatment Cost – Highest Priorities Option

GS –11 Botanist	$485/day x 10 days =	$4,850
GS – 7 Bio Tech Crew Leader	$277/day x 1 pay period (10 days) =	$2,770
GS – 5 Bio Tech	$225/day x 1 pay period (10 days) =	$2,250
GS – 5 Bio Tech	$225/day x 1 pay period (10 days) =	$2,250
GS – 5 Bio Tech	$225/day x 1 pay period (10 days) =	$2,250
Mileage:	1,000 miles @ 0.37/mile =	$370
Lodging:	$60/day x 50 days	$2,400
Per Diem:	$60/day x 50 days	$2,400
	Total Cost Estimate for FY 2008 =	**$19,540**

IV. Appendices

Appendix a

Invasive Noxious Weed Profiles

Centaurea solstitialis - Yellow Starthistle
Yellow Starthistle is a winter annual that can form dense impenetrable stands that displace desirable vegetation in natural areas, rangelands, and other places. It is best adapted to open grasslands with deep well-drained soils. Yellow Starthistle originated from southern Europe but was introduced from Chile to California during the gold rush. It has spread rapidly since the mid-1900s and is now estimated to infest 15-20 million acres in California and a couple of additional million acres in other western states.

Foeniculum vulgare - Wild Fennel
Wild fennel or sweet anise is a Southern European perennial with ferny foliage which can grow to 10 ft. and is commonly scattered about fields, rocky roadbanks, and waste places. It invades areas where the soil has been disturbed and can exclude or prevent re-establishment of native plant species. It can drastically alter the composition and structure of many plant communities, including grasslands, coastal scrub, riparian, and wetland communities. It out competes native species for light, nutrients, water, and perhaps by exuding allelopathic substances that inhibit growth of other plants.

Centurea melitensis - Tocalote
Tocalote is closely related to, and very similar to Yellow Starthistle. It can spread rapidly to become dense infestations that are nearly impossible to treat. These invasions displace native plants and animals, threatening natural ecosystems and nature reserves. Long-term ingestion by horses causes a neurological disorder known as chewing disease, a lethal lesion of the nigropallidal region of the brain. Both species interfere with grazing and lower yield and forage quality of rangelands, thus increasing the cost of managing livestock. In addition, both plants reduce land value and limit access to recreational areas.

Tamarix ramosissima - Saltcedar
Salt cedar plants are spreading shrubs or small trees, 5-20 feet tall, with numerous slender branches and small, alternate, scale-like leaves. The pale pink to white flowers are small, perfect and regular, and arranged in spike-like racemes. As an aggressive colonizer that is able to survive in a wide variety of habitats, saltcedar often forms monotypic stands, replacing willows, cottonwoods, and other native riparian vegetation. The stems and leaves of mature plants secrete salt, forming a crust above and below ground that inhibits other plants. Saltcedar is also an enormous water consumer. A single large plant can absorb 200 gallons of water a day. Saltcedar spreads by seed and also resprouts vigorously from roots if the top portion of the plant is damaged or removed. It can also readily establish from cuttings, if buried in moist soil.

Taeniatherum caput-medusae - Medusahead
This Eurasian winter annual grass is found throughout the west and is extremely invasive. It typically invades rangeland communities and will out-compete desired species reducing grazing capacity. Dense stands often develop, displacing desirable vegetation and wildlife, and lowering the livestock carrying capacity. It forms a dense layer of litter that decomposes slowly, changing the temperature and moisture dynamics of the soil, greatly reducing seed germination of other species, and creating more fuel for wildfires.

Centaurea repens - Russian knapweed
Russian knapweed is a creeping perennial weed native to Eurasia. It spreads by underground roots that may go to a depth of 8 feet or more and it puts out a chemical that inhibits other species from growing near it. It grows in pastures, rangeland, roadsides, waste areas, and on neglected agricultural land. Russian knapweed is toxic to some animals and must be handled carefully. In severe cases the animal may die. However, cattle and sheep are not affected.

Spartium junceum - Spanish broom
Spanish broom is a Mediterranean shrub with colorful bright yellow flowers, which has become widely naturalized in rocky road cuts and in nearby chaparral. This is the plant of most concern due to its aggressive invasion response

following wildfire. Because Spanish broom builds up a tremendous seed bank awaiting fire for germination, wildfires produce high seedling densities and promote broom spread.

Circium vulgare - Bull Thistle
Bull Thistle is a water-loving biennial herb that displaces native riparian vegetation along creeks and in meadows. It grows a deep root and a basal rosette the first year of its life. It bolts, flowers, sets seed, and dies in its second year. It is adapted to seasonally moist, well-drained, deep soils. It thrives on light and moderate mechanical soil disturbance.

Cardaria pubescens - White Top
White top or globe-podded hoarycress is on the State Noxious Weed List as a "B" Pest and is an Asian perennial with hairy globular pods, typically scattered as colonies on dry roadsides. The response of this species to fire is unknown.

Appendix b

Highest Priority Roads, Dozer Lines, Drop Points, and Safety Zones affected by the Zaca fire

Name	Location
Sierra Madre Road (32S13)	from Bates Canyon To Santa Barbara Canyon (including these Canyons)
Sierra Madre Ridge Dozer Lines	from Bates Canyon To Santa Barbara Canyon (including these Canyons)
Sierra Madre Drop Points (7)	Drop Points along Sierra Madre Road (32S13)
Figueroa Mountain Roads (7N07, 8N08, 8N02, 8N03, 8N08)	from Forest Boundary in
Figueroa Mountain Dozer Lines	All Lines between McKinley Mountain and Zaca Peak
Figueroa Mountain Drop Points (8) and Safety Zones(5)	All Drop Points and Safety Zones between McKinley Mountain and Zaca Peak
Buckhorn Road (9N11)	from Hidden Potrero (5N15) to Sierra Madre Road (32S13) including Santa Cruz Spur (6N14)
Buckhorn Dozer Lines	from Hidden Potrero (5N15) to Sierra Madre Road (32S13) including Santa Cruz Spur (6N14)
Buckhorn Safety Zone(1)	Southeast of Happy Hollow
Paradise Road (5N18)	from Forest Boundary to Red Rock Trailhead including Oso Rd. (5N15)
Paradise Dozer Lines	between Forest Boundary and Camuesa Peak
Paradise Safety Zones (2)	Red Rock Trailhead & Gibraltar Dam
East Camino Cielo (5N12)	from Highway 154 to Divide Peak
East Camino Cielo (5N12) Dozer Lines	from Highway 154 to Divide Peak including spurs down to Santa Ynez River
East Camino Cielo (5N12) Drop Points (8) and Safety Zone(1)	from Highway 154 to Divide Peak
Romero Camuesa Road (5N15)	from 5N12 to Mono Creek including Agua Caliente Road (5N16)
Juncal Road (5N13)	from Romero Camuesa Road (5N15) to Potrero Seco Road (6N03)
Pendola Jeepway (5N01)	from Romero Camuesa Road (5N15) to Potrero Seco Road (6N03)
Pendola Dozer Line	from Romero Camuesa Road (5N15) to Potrero Seco Road (6N03)
Potrero Seco Road (6N03)	from Juncal Road (5N13) to Highway 33
Potrero Seco Drop Points (3)	Three Sisters, Potrero Seco, and Highway 33

Summary
Zaca Fire Wildlife Assessment for BAER
Los Padres National Forest

Resource specialty: Wildlife and Fisheries
Fire Name: Zaca
Date: September 8, 2007
Author: Marc Stamer, Wildlife Biologist, San Bernardino NF

I. Potential Values at Risk

This report assesses the effects of the Zaca Fire and the proposed effects of the burned area emergency rehabilitation (BAER) treatments on the federally listed:

- California condor (*Gymnogyps californianus*)* and Critical Habitat*
- Least Bell's vireo (*Vireo bellii pusillus*)* and Critical Habitat
- Southwestern willow flycatcher (*Empidonax traillii extimus*) and Critical Habitat
- Arroyo toad (*Bufo californicus*)* and Critical Habitat*
- Southern steelhead (*Oncorhynchus mykiss*) southern California Evolutionarily Significant Unit (ESU)* and Critical Habitat*
- San Joaquin fox (*Vulpes macrotis mutica*)
- California red-legged frog (*Rana aurora draytonii*)* and Critical Habitat*
- Vernal pool fairy shrimp (*Branchinecta lynchi*) and Critical Habitat
- Blunt nosed leopard lizard (*Gambelia sila*)*

This analysis also assesses the effects of the Zaca Fire and proposed BAER treatments on the following Forest Service Region Five Sensitive species:

- Northern Goshawk (*Accipiter gentiles*)
- California Spotted Owl (*Strix occidentalis occidentalis*)*
- Willow flycatcher (*Empidonax traillii*)*
- Peregrine falcon (*Falco peregrinus anatum*)
- Mt. Pinos Lodgepole Chipmunk (*Tamias speciosus callipeplus*)
- Pallid Bat (*Antrozus pallidus*)
- Western Red Bat (*Lasiurus blossevillii*)
- Southern Pacific Pond Turtle (*Actinemys marmorata pallida*)*
- San Diego Horned Lizard (*Phrynosoma coronatum blainvii*)*
- California Legless lizard (*Anniella pulchra*)*
- Southern Rubber Boa (*Charina bottae umbratica*)
- Two-striped Garter Snake (*Thamnophis hammondii*)*
- Foothill Yellow-legged frog (*Rana boylii*)
- Yellow-blotched ensatina (*Ensatina escholtzii croceator*)

(* Denotes known within burn perimeter based on Los Padres NF species occurrence database.)

II. Resource Condition Assessment

A. Resource Setting

The overall soil burn severity for the 240,207 acre Zaca Fire consists as a mix of 14% unburned, 18% low, 54% moderate, and 14% high. Based on the fire history maps most of the high soil burn severity areas had not burned since the 1920's or before. Fifty percent of the high soil severity occurred in the xeric chaparral, and 25% in the mesic chaparral vegetation types. There are three general classes of sensitive wildlife that were affected by the fire: chaparral species, high elevation conifer species, and riparian species.

The chaparral species of special interest is the San Joaquin kit fox and the San Diego Horned Lizard.

The high elevation conifer species are:

- Northern goshawk
- California spotted owl
- California condor
- Peregrine falcon
- Mount Pinos Lodgepole Chipmunk
- Yellow blotched ensatina
- Southern rubber boa

The riparian species are:

- Willow and Southwestern Willow Flycatchers
- Least Bell's vireo
- Southern Pacific Pond Turtle
- California Legless lizard
- Two-striped garter snake
- Foothill yellow-legged frog
- Arroyo toad
- Southern steelhead
- California red-legged frog
- Vernal pool fairy shrimp
- Western red bat
- Pallid bat
- Townsend's big eared bat

B. Finding of On-the-Ground Survey

1. Resource condition resulting from the fire.

Riparian habitats generally burn very light or not at all, however some exceptions did occur throughout the fire area, direct impacts to riparian habitat as a result of burning are expected to be minimal based on initial burn area assessment.

Chaparral habitats (mesic and xeric) are the dominate (64%) vegetation types within the burn perimeter. Seventeen percent of the chaparral habitats experienced high severity, 60% burned moderate, 14% burned low and 9% were unburned.

High elevation conifer habitats (big cone Douglas fir, mixed conifer, and Coulter pine) primarily experienced (40%) moderate burn severities. Sixteen percent had high severity, while 20% and 24% were low and unburned respectively. Unburned islands of conifer habitat are present throughout the fire area.

2. Consequences of the fire on values at risk.

Riparian species: Burned riparian areas typically recover rapidly post fire due to high soil moistures and ability of most riparian woody plants to crown sprout. Riparian areas throughout and below the fire area will be subjected to increased scouring and debris flows over the next three to five years resulting in changes to channel morphology, lowered water quality, and erosion of streambanks and associated riparian vegetation. Wide channels with low slope profiles will continue to experience realignment of watercourses and braided channels up to ten years following the fire.

While it is likely that adult riparian dependant bird species (ex. least Bell's Vireo, willow flycatcher) fled the fire area, they may have experienced loss of young that had not fledged. Loss of habitat as a result of the fire and post fire flooding events will be a short-term affect to riparian dependant avian species.

Fire effects on amphibian species such as the arroyo toad are expected to be benefit as a result of the fire and post fire watershed response which will reestablish sand bars and suitable breeding habitat. California red-legged fires may have loss of egg masses as a result of post fire watershed responses thus affecting reproductive effort. Flood events will also establish new pools and exposed streambanks thus improving habitat for red-legged frogs.

Reptilian species such as the aquatic two-striped garter snakes and southern pacific pond turtles will be temporarily displaced, however should benefit by the establishment of sand bars and regeneration of riparian vegetation.

Southern steelhead will be affected by increased sediment delivery into stream channels which will cause temporary increases in suspended sediment and alter streambed gravel deposits and riparian vegetation along streambanks.

Chaparral species: Horned lizards likely experienced direct mortality and loss of habitat but are expected to eventually move back into the burned areas after the brush recovers in 3-5 years. Suitable habitat for the San Joaquin kit fox within the fire perimeter burned moderate to low with large amounts of unburned vegetative patches. Note: If any fiberglass wildlife guzzlers were burnt by the fire, the "micro-trash" remaining on site can present a serious and possibly lethal risk to California condors that are attracted to trash and debris. See Appendix G regarding need for further assessment of this risk.

High elevation conifer species: There were approximately 15,894 acres of conifer species of which 40% (6,292 acres) burned moderately. It is anticipated that over the next 2-3 years the areas of high to moderate severity could result in mortality and loss of habitat for the California spotted owl. Pockets of low and unburned conifer species (44%) exist in patches throughout the fire area and should provide suitable habitat for species dependant on conifer species.

III. Emergency Determination

Values at risk exist for wildlife species throughout the fire area as a result of the increased potential for noxious, nonnative weed expansion into the fire area. Detrimental impacts that could impede native vegetation recovery such as increased off-highway vehicle access off of Forest system roads into areas denuded of vegetation and stray cattle grazing from adjacent allotments could also affect wildlife species recovery within the burn area.

Emergency conditions resulting from the Zaca Fire exist for the following riparian species that will be impacted from increased sediment and high flows:

- Southern steelhead
- California red-legged frogs
- Foothill yellow-legged frog (if extant)
- Southern pacific pond turtle
- Two-striped garter snake
- Arroyo toad

Emergency conditions resulting from the Zaca Fire exist for the following high elevation conifer species that will suffer a temporary loss habitat:

- Southern rubber boa
- Mount Pinos Lodgepole chipmunk
- California spotted owl

Emergency conditions exist for the San Diego Horned Lizard because of the loss of habitat and direct mortality from the fire.

IV. Treatments to Mitigate the Emergency

A. Treatment type

No treatments under BAER are recommended because of the lack of effective options and because under natural recovery conditions we expect all of the above species to recover from this fire. Treatments prescribed such as an area closure and noxious weed detection surveys will help to facilitate native plant regeneration which will indirectly benefit wildlife and fish species within and adjacent to the fire area

B. Treatment objective: N/A

C. Treatment Description: N/A

D. Treatment Cost: N/A

V. Discussion/Summary/Recommendations: See Wildlife Specialist Report

VI. References See wildlife specialist report

APPENDIX E

Resource Specialty: Archeology

Fire Name: Zaca
Date: September 13, 2007
Authors: David Lowe, Archeologist, Contractor
Wade Kaiser, Archeologist, Chiricahua, National Monument.

Site Risks

- Wind Erosion
- Water Erosion (Deflation)
- Site Burial (Alluviation)
- Foot Traffic
- Vehicular Traffic
- Looting

Site Types

- Upland Prehistoric Sites
- Bottomland Prehistoric Sites
- Rock Art Sites
- Historic Sites

Monitoring Sample

Of the over 250 archeological sites located within the burned area, 10 sites were monitored.

- Historic Sites (1)
- Upland Prehistoric Lithic Sites (3)
- Bottomland prehistoric Lithic Sites (2)
- Rock Art Sites (4)

Site Risk Impacts

With moderate to high burn severity over much of the burn, many of the cultural sites have lost their soil stabilizing vegetation. The soil organics were often deeply burned, leaving thick layers of ash covering the site areas. These layers are extremely susceptible to wind and water erosion across the burn area. Windborne debris (including ash) also may have a negative effect on the rock art surfaces. Water erosion will be a major problem throughout the burn (deflation), which can remove in situ site deposits and move cultural material down slope, leaving artifacts exposed. Sites located in the uplands, or on sloping ground will especially be susceptible to this type of erosion. Down slope or bottomland sites can be covered or buried by material (alluvium) flowing onto the area from higher ground. See associated Watershed Condition Assessment Appendix F.

Foot and vehicular traffic have the potential to accelerate soil loss, especially along foot paths, trail, or roadways. Burned vegetation will lead to easier access to site areas. The burned duff layer and all of the erosional effects will significantly expose site features including artifacts.

Mitigation Treatments

Erosion of the cultural sites due to the effects of the fire is going to become a fact, especially with the onset of the rainy season. Damage due to foot and vehicular traffic, along with artifact looting can be drastically reduced with limiting access of the public to the burn area. It is of utmost importance to restrict this access with the strategic placement of gates, large boulders, or other physical barriers. These barriers should at least be left in place until next spring to let the rainy season have a chance stimulate the growth of some of the vegetation. This will help restrict some of the foot and vehicular traffic, and will start to cover up some of the artifacts that will undoubtedly be uncovered during the rains.

Two of the rock art sites that we assessed warrant further treatments. The rock shelter at Pool Rock (53-262) has two 10 foot long wooden water bars located in front of the shelter that have burned and will need to be replaced. Condor Cave (53-263) has 12 wooden steps leading up to the cave that also have burned and will have to be replaced. Failure to replace the water bars and steps will lead to additional erosion due to the high severity of burn in those areas.

Treatment Costs

Line Item	Units	Unit Costs	Total funding
GS-9 Archeologists (2)	3 days	$260/day	$1560
2 pack-stock w/packer	2 days	$1000/day	$2000
Lumber: 18 4”X4”X36” treated lumber with 18” long rebar anchors			$ 250
Mileage rate for vehicles	100 miles	$.85/mile	$ 85
Backcountry per diem	2	$50/day	$ 100
Total			**$ 3995**

WATERSHED CONDITION ASSESSMENT
for
ARCHAEOLOGY WILDERNESS FIELD VISITS

Zaca Burned Area Assessment **September 14, 2007**

Robert Taylor
Extended BAER Team Hydrologist
San Bernardino National Forest
San Bernardino, California

Objective

Determine if the watershed condition above significant archaeology resources will put the sites in danger from increased erosion from above the sites.

Observations and Findings

Field visits were conducted on September 11, 2007 and September 12, 2007. Helicopter access was used to reach the general area of the archaeology sites, generally classified as caves with rock art and other significance. For safety reasons, the helicopter generally had to land at a distance from the sites, allowing for hiking through the wilderness.

On the hikes to the field sites, visual and experiential observations were made of the erosion potential. The soil is very loose. Dry ravel was a continual problem, causing much slippage when not traveling along ridges. Drainage channels and pathways had large amounts of stored sediment. Though there were many areas where the bedrock extruded from the surface, locations away from the bedrock outcroppings had between one inch and more than 8 inches of mobile material.

On September 11, 2007, the archaeology sites visited were generally within areas classified to be moderate to high burn severity (Appendix A). Fortunately, the rock outcroppings were generally located at the top of mounds, hills, and short ridges. Rarely was there any significant upslope area that could contribute sediment to the area. There will likely be erosion below the sites, which could limit future access to the sites by the public or could require trails to the sites to be improved (see Photos for Day 1, Appendix B in official record).

On September 12, 2007, the field day was cut short by fog at the airfield persisting until 11:00 hours. The field visit consisted of finding a site known as Wizard Cave. One primary difference of this section of the fire is that the landscape showed a patchwork of unburned islands, surviving riparian when water was present, and low to moderate soil burn severity, with smaller portions of high soil burn severity. Travel through this area was made easier by a wilderness trail that still had intact wooden stairs. Some travel cross slope and across drainages was still needed, and the large component of dry ravel was again present. Unfortunately for the site in question, a large collection of fuel was reported to be at the front of the cave. Upon our inspection, there was a thick pile of white ash and the rock containing the paintings showed evidence of spalding. The rock outcrop containing the paintings again did not have significant erosion sources above it that could erode into it. The rock outcropping was at the edge of a floodplain, but the patchwork of unburned vegetation in the area

should protect the site from significant floodplain water damage given the type of modeled storm used in BAER assessments (see Photos for Day 2, Appendix C in official record).

Emergency Determination

A combined heritage resource location and on-the-ground watershed assessment concluded that the location of sites topographically and within the affected watersheds indicates that: 1) upland erosion onto the sites is not an emergency condition, 2) increased erosion downslope of sites could expose artifacts (an emergency condition), 3) foot and vehicular traffic could increase downslope erosion (an emergency condition), and 4) loss of vegetation could allow for more access to the sites (an emergency condition). Based on this information, the BAER Team recommends that the wilderness remain in a state of closure until vegetation returns to add to soil stability and access to sites from trails be improved to enhance slope stability and protect public safety.

Appendix A

Soil Burn Severity Evaluation Criteria

The soil burn severity was determined by using visual reconnaissance from overlooks and on the ground.

The burn severities were distributed broken up into four categories; unburned, low, moderate and high. Following is a description of general observations used to determine low, moderate and high values.

Low - Leaves/needles may were green and unscorched, and remain on vegetation. In areas dominated by brush or trees, litter is not continuously burned. Plant twigs and leaves are usually identifiable. Many unstable slopes are typically mapped as low intensity because the slopes typically have little to no cover prior to the fire.

Moderate - Leaves/needles have been scorched but may remain on tree. Smaller shrubs may be burned down to main stem. Litter and duff is burned over most of the area, but is not completely burned to the soil surface at most locations. Hydrophobic layers are discontinuous. Brush stubs are visible.

High - Medium and fine branches have been burned from trees and large shrubs. Canopy totally consumed on conifers. Smaller shrubs are usually burned to short staubs. Litter and duff is usually burned to the soil surface over most of the area, leaving only a cover of ash (white/gray) above the mineral soil. There are usually patches where duff is partially or not completely consumed.

NOTE: APPENDICES B & C (photos of sites visited) are not included in this report due to size of files.

APPENDIX G

Santa Barbara and Mt. Pinos Ranger Districts Preliminary HAZMAT Assessment

Authored by: Marc Stamer, Wildlife Biologist, San Bernardino NF and
Donna Toth, Forest BAER Coordinator, Los Padres NF

An emergency determination has been made by the BAER Team Wildlife Biologist that there is the potential for hazardous conditions associated with burnt fiberglass wildlife guzzlers within the burn area. The HAZMAT risk associated with damaged or destroyed fiberglass guzzlers is two fold; first, the guzzlers could present a HAZMAT risk to humans who may come in contact with the exposed fiberglass fibers (which could result in a breathing hazard at the site and possibly down-wind for a distance), and second, the "micro-trash" left exposed on the landscape from a damaged/burnt guzzler will likely be a prime attractant to federally listed California Condors (*Gymnogyps californianus*) and can lead to their harm or death when ingested.

Eight guzzlers have been identified through record searches on the Santa Barbara and Mt. Pinos Ranger Districts that require further assessment to determine: 1) if they were burnt, 2) if they are made of fiberglass – or if they are actually made of concrete which would not be expected to present a HAZMAT risk, and 3) what type of treatment would be required to mitigate the risk (prevention, control, or removal of threat). Any prescribed treatments would be presented in an Interim report after the complete assessment.

Forest Service Manual Reference for HAZMAT:
Guidance in FSM 2523 provides for "emergency treatments to minimize threats to life or property or to stabilize and prevent unacceptable degradation to natural or cultural resources resulting from the effects of the fire." Depending on the situation, hazardous materials might be considered a threat to human health or have high potential for unacceptable degradation to natural resources such as water, soil or wildlife.

Assessment Costs:

Santa Barbara Ranger District

Little Pine Mountain Quad: 3 guzzlers (G-7, G-6, and G-10: Little Pine area)
1 GS-9 for 1 day, plus 1 vehicle for 300 miles
Old Man Mountain Quad: 2 guzzlers (along Forest Road 6N03)
1 GS-9 for 1 day, plus 1 vehicle for 300 miles
Rancho Nuevo Creek Quad: 1 guzzler (N and E of Potrero Seco)
1 GS-9 for 2 days, plus 1 vehicle for 600 miles
Big Pine Mountain Quad: 1 guzzler (E of Buckhorn Canyon Road [9N11] section 3)
1 GS-9 for 1 day, plus 1 vehicle for 300 miles

Summary

Line Item	Units	Unit Costs	Total Funding
1 GS-9	5	$310/day	$1550
Vehicle Mileage	1500	$ .50/mile	$ 750
			$2300

Mt. Pinos Ranger District

Rancho Nuevo Creek Quad: 1 guzzler (S of Forest Road in Brubaker Canyon)
1 GS-9 for 1 day, plus 1 vehicle for 300 miles

Summary

Line Item	Units	Unit Costs	Total Funding
1 GS-9	1	$310/day	$ 310
Vehicle Mileage	300	$ .50/mile	$ 150
			$ 460

Total assessment costs: **$2,760**

Interim #1:
Guzzler Removal

The Forest Service will remove the remains of six fiberglass wildlife guzzlers that were destroyed as a result Zaca Fire. In the initial BAER assessment the following guzzlers were identified as possibly burned over during the Zaca Fire:

- ***Little Pine Mountain Quad: 3 guzzlers (G-7, G-6, and G-10: Little Pine area)***
- ***Old Man Mountain Quad: 2 guzzlers (along Forest Road 6N03)***
- ***Rancho Nuevo Creek Quad: 1 guzzler (N and E of Potrero Seco)***
- ***Big Pine Mountain Quad: 1 guzzler (E of Buckhorn Canyon Road [9N11] section 3)***
- ***Rancho Nuevo Creek Quad: 1 guzzler (S of Forest Road in Brubaker Canyon)***

After the initial assessment only three of these guzzlers were found to be fiberglass and in need of removal (G-10, 1 guzzler on the Old Man Mountain Quad or G-5, and one guzzler on the Rancho Nuevo Quad or G-9). One guzzler identified on the Mount Pinos Ranger District on the Rancho Nuevo Quad was found to be concrete and did not need any treatment. Other guzzlers that were not identified in the initial assessment were found to be fiberglass and were within the fire area. Some of these guzzlers were unharmed by the fire and others were burned over.

After further inspection the following guzzlers have been identified as in need of removal:

Santa Barbara Ranger District

Little Pine Mountain Quad: 3 guzzlers
Guzzler G-5, a parabolic type, on forest road 9N11B can be accessed from a dozer line near Happy Hollow Campground (T6N R27W Section 17 SE1/4 NW1/16). A high clearance vehicle will be needed to drive to the site.

Guzzler G-9, a parabolic type, is a Located off the Buckhorn Trail 1/3 mile from the Buckhorn Road or forest road 9N11(T6N R27W Section 22 SW1/4 NE1/16).

Guzzler G-10, a small game rectangular type, is located about 50 meters off the Buckhorn Road (T6N R27W Section 9 SE1/4 NE1/16).

Rancho Nuevo Creek Quad: 1 guzzler
Guzzler S-1, a small game rectangular type, is located off forest road 6N11 east of Potrero Seco (T6N R25W Section 8, at the junction of 6N03 and 6N11). This guzzler is a short distance from the road.

Ojai Ranger District

Old Man Mountain Quad: 1 guzzler
Guzzler B-5, a parabolic type, is located along forest road 6N03 (T6N R25W Section 35 NE1/4 NE1/16). This guzzler is a short distance from the road.

Rancho Nuevo Creek Quad: 1 guzzler
Guzzler B-9, a parabolic type, is located along Forest Road 6N03 (T6N R24W Section 2 Ne1/4 SE1/16). The site can be driven to.

A high clearance truck will be needed to haul the materials out. A tailgate safety session will be conducted prior to work and the job hazard analysis will be discussed. The loose fiberglass materials will be wetted down prior to removal using a firefighter backpack pump. Personnel will wear all appropriate personal protective equipment and will change between sites so as not to transfer

fiberglass into the vehicle. The fiberglass will be placed in garbage bags and within heavy-duty tarps and folded up and secured with duct tape. One site will require personnel to pack the guzzler remains out about 1/3 mile. The garbage will be taken to the transfer station so it can be disposed of properly.

Line Item	*Units*	*Unit Costs*	*Total*
1 GS-9 Wildlife Biologist	*10*	*$310/day*	*$3100*
2 GS-5, Fire Tech	*10*	*$208/day/person*	*$4160*
Vehicle Mileage	*1500*	*$ .50/mile*	*$750*
Tyvek Suits	*18*	*$7*	*$126*
Particulate Respirator	*2*	*$20 (box of ten)*	*$40*
Safety Glasses	*6*	*$4*	*$24*
Emergency Eye Wash	*2*	*$10*	*$20*
Nitrile gloves	*1*	*$15 (box of 100)*	*$15*
Heavy duty tarp	*10*	*$20*	*$200*
Duct tape	*5*	*$6*	*$30*
Garbage bags	*2*	*$12 (per box)*	*$24*
Disposal Fee	*1*	*$50*	*$50*
		Grand Total	*$ 8,539*