GAP FIRE

Operations Section Plans

Emergency Watershed Response Plan
August 2008

The Gap Fire started on July 1, 2008, just off West Camino Cielo in the Santa Ynez Mountains above Goleta. The fire grew in the following days and ultimately burned almost 10,000 acres of land. The fire area map is shown below in Figure 1.

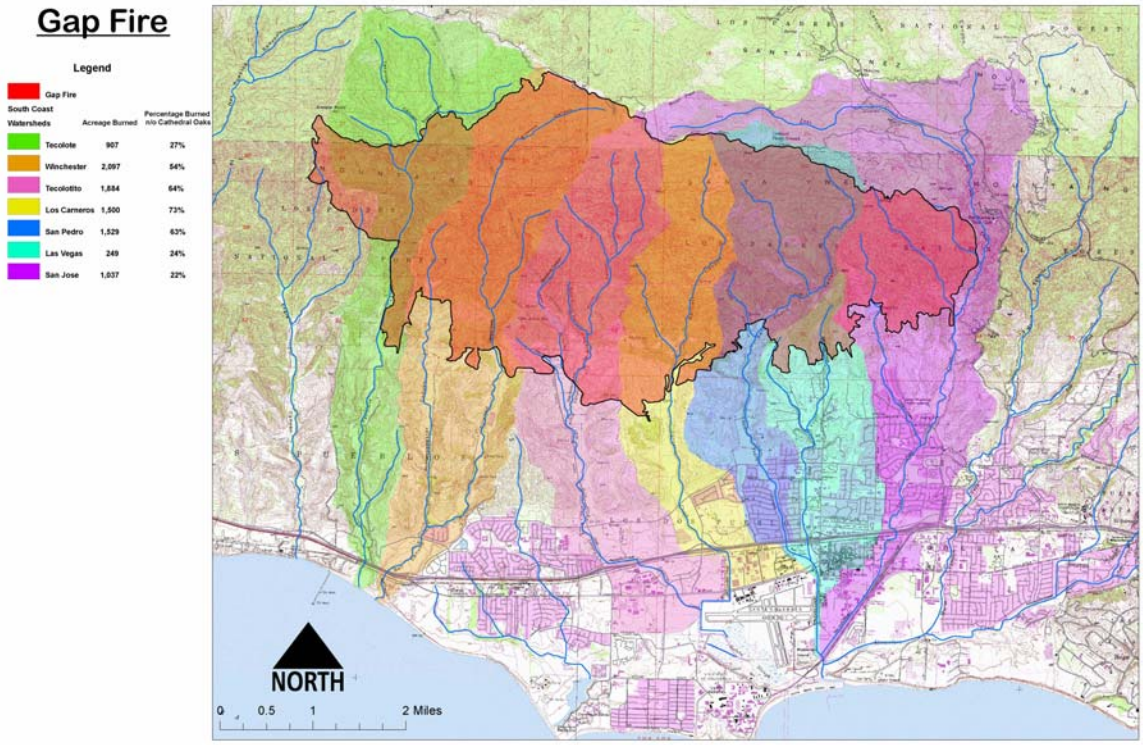

Figure 1 – Gap Fire Location

The fire burned portions of the following watersheds; Tecolote, Winchester/Ellwood, Glenn Annie/Tecolotito, Carneros, San Pedro, Las Vegas, and Fremont/San Jose. A summary of acres burned and proportion of the watershed burned is given in Table 1. Unless otherwise noted, the percent of watershed that was burned was calculated based on the watershed area above Cathedral Oaks Rd.

Table 1 – Watershed Fire Statistics

Watershed	Acres Burned	Percent of Watershed
Tecolote	984	27%*
Winchester	2,103	54%*
Tecolotito	1,892	64%
Los Carneros	1,508	73%
San Pedro	1,535	63%
Las Vegas	252	24%
San Jose	1,080	23%

*Percentages calculated using total watershed area.

The Santa Ynez Mountains rise steeply from the beach and the low-lying areas of Goleta to mountain crest elevations of about 3,000 ft. Because of the steep terrain, generation and transport of debris and sediment from the mountains to the channels that run through

the City is a major concern. Larger debris typically drops out further up the canyons with the smaller sediment being deposited in lower gradient channels downstream. A dramatic increase in winter runoff is expected from the burn area, which is anticipated to exacerbate erosion and lead to increased delivery of woody debris and sediment downstream.

In past years, woody debris has contributed to flooding in areas downstream of burned watersheds by plugging culverts and causing water to back up upstream.

Downstream within the tidal influence, the coastal streams in the area converge at the Goleta Slough. The Slough experiences naturally high sedimentation rates, which over time have caused the size of the Slough to shrink from its historic extent. Sediment basins located on Tecolotito, Carneros, San Pedro and San Jose Creeks are regularly excavated in order to maintain the Slough for habitat and conveyance of water to the ocean. Sedimentation rates are expected to be especially high in the years following the Gap Fire. The Santa Barbara Airport is located within the limits of the historic Goleta Slough and is susceptible to flooding that may result from sedimentation in the surrounding creeks.

Following each major fire on U.S. Forest Service (USFS) lands, the USFS prepares a Burn Area Emergency Response Report (BAER Report) to address the impacts of the fire on the burned watersheds, predict the effects of the fire on runoff and erosion, identify values at risk from adverse impacts related to the fire, and make recommendations for mitigation measures that can be carried out on affected federal lands.

On non-federal lands, the USFS is precluded from taking any action. The Santa Barbara County Public Works Department has identified a number of initiatives that may be undertaken in these areas to lessen the adverse impacts of the Gap Fire. Those initiatives are summarized in this Gap Fire Emergency Watershed Response Plan. It is important to note that the severity and extent of the fire and its proximity to urban areas creates a risk to downstream communities that cannot be fully mitigated. This plan proposes to mitigate the risk to the fullest extent possible by the following actions:

- Prepare existing downstream creek channels to convey the maximum flow rate possible;
- Excavate existing sediment basins at the airport in order to begin the season at maximum basin capacity;
- Install debris racks to intercept woody debris;
- Provide emergency protective measures at selected key locations;
- Operate a sand bag station to provide sand and bags to residents who live downstream of the burn area;
- Operate an aggressive winter operations program to maintain flow conveyance and sediment basin facilities;
- Prepare locations for disposal of flood debris and sediment;
- Assist private land owners with flood protection measures; and

- Coordinate efforts and share information among responding and responsible agencies.

This plan is one element of the Operations Section Plan being directed by the Operational Area and is subject to amendment as new information becomes available and/or new projects are identified.

Mitigation Measures

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I. Pre-Winter Preparations

A. Channel and Basin Preparations

Prior to the onset of winter, the Flood Control District will work in cooperation with the Cities of Goleta and Santa Barbara to maximize the capacities of the creek systems. This work includes:

- Stream clearing of approximately 16 miles of creek channels downstream of the burn area. This work will consist of removing obstructive vegetation in the bottom of creek channels, removing any down or dead vegetation, and removing any existing debris jams and obstructions that may inhibit flow; and

- Excavation of existing sediment basins at the airport including Tecolotito Creek Basin, Carneros Creek Basin, San Pedro Creek Basin, and San Jose Creek Basin.

Stream clearing will provide maximum capacity in the stream systems while preserving the natural vegetation on the slope to help prevent erosion. With extremely high levels of sediment expected, initial excavation of the sediment basins at the airport will allow the year to start with the maximum capacity available.

The reaches of stream clearing and sediment basin excavations are shown in Appendix A.

B. Installation of Vegetation Control Structures – "Grizzly Racks"

Prior to winter, five large woody debris racks, also called "Grizzlies," are planned, one each on Ellwood Creek, Tecolotito Creek, Carneros Creek, San Pedro Creek, and Las Vegas Creek. The proposed locations of these facilities are

shown in Appendix B. No debris rack is proposed on San Jose Creek because a relatively low percentage of the watershed was burned and San Jose Creek generally has a higher channel capacity and lacks restrictive culverts.

During the fall, additional debris rack locations may be identified based on risk and access. One rack currently exists on Tecolote Creek below Rancho Embarcadero; a photo of this facility is shown below in Figure 2.

Figure 2 – Existing Debris Rack on Tecolote Creek during the 1998 Floods

C. Emergency Protective Measures

Three critical locations have been identified for additional protective measures. Criteria for locating protective measures are 1) a relatively high level of risk resulting from the proximity of the site to affected creek channels; 2) documented historic flooding problems; and 3) feasibility of treatments that will provide an increased level of flood protection. Currently, the areas proposed for additional protective measures are: Los Carneros Road area at Calle Real, along San Pedro Creek near Calle Real, and at the end of Camino Rio Verde. The treatments include the use of K-Rail barriers, sandbags, berms, and culvert improvements as appropriate. Additional treatment locations may be added in the future. Figure 3 below shows similar work undertaken after the Painted Cave Fire in 1990. Locations of the proposed protective measure sites are shown in Appendix C.

Figure 3 – Placement of K-Rail after the Painted Cave Fire in 1990

D. Hydromulching of Non-Federal Lands

One fire mitigation measure proposed by the USFS is hydromulching of federal lands within the burn area where slopes have a gradient of 60% or less. Hydrolmulching is a treatment of organic mulch with the addition of a tackifier to help bind the mulch in place. The hydromulch would be applied by air.

Because the USFS is precluded from carrying out treatments off of federal lands, the responsibility for any such treatments falls to the Natural Resources Conservation Service (NRCS) in cooperation with a local sponsor. Approximately 50% of the burn area is located on non-federal lands. Treatment of the non-federal lands offers benefits to ranch owners, the downstream areas in the City of Goleta, and the airport. County Public Works will take the lead as the local sponsor and has requested the costs for this broad recovery effort be shared between the County, the City of Goleta, and the City of Santa Barbara.

The USFS will be making arrangements with a contractor for the aerial hydromulching of federal lands and has indicated that they would also make this treatment available to qualifying lands outside the USFS jurisdiction on a reimbursable basis, using the same contractor and thus utilizing the economy of scale and mobilization. If approved by the NRCS (NRCS would cover 75% of the cost), aerial hydromulching is planned for non-federal lands where slopes are less than 60% and the land cover is not urban or orchards. The proposed area to be treated is subject to approval by land owners and funding made available by the NRCS. Figure 4 is a photo of the application of aerial hydromulch by the USFS in Colorado.

Figure 4 – Aerial Hydromulching (USFS, Colorado 2002)

II. Winter Monitoring, Operations, and Maintenance

Following a fire, burned watersheds yield a dramatic increase in runoff, sediment, and debris. Throughout the winter, Public Works staff will monitor conditions and take action to remove obstructive material in order to keep the creek systems clear and open.

A. Airport Sediment Basins

On-going dredging of the airport sediment basins will be a necessary and essential element of this winter's response efforts. Without active dredging, the channels will clog with sediment, resulting in reduced capacities. It is possible that the basins could be overwhelmed in a single rain event, in which case immediate emergency desilting will be required.

Excavation of the basins is accomplished by large heavy cranes and possibly assisted by larger long-reach excavators. Sediment is temporarily stockpiled and then removed to make room for mare material as the operation continues.

Figure 5 below shows desilting of the Carneros Sediment Basin in 1995.

Figure 5 – Carneros Creek Sediment Basin, 1995

B. Maintenance of Grizzly Debris Racks

Throughout the winter, especially after individual storms, the debris racks will be inspected and cleaned of debris as necessary. The racks are cleaned using a small hydro-crane or cable winch truck. Captured vegetation will be temporarily stockpiled until it can be moved to a disposal site.

These facilities may act as temporary measures and may be removed after five to ten years if permit conditions require. Similar temporary actions were undertaken after the Marre Fire in 1994.

C. Removal of In-Stream Sediments and Debris Jams

In the event that stream channels below the fire area become choked with sediment or debris jams, the obstructions will be cleared as soon as possible using equipment or by hand clearing as appropriate and safe.

The respective Cities are responsible for maintenance and clearing of public bridges and culverts within each respective City, and for maintenance of their individual drainage systems. Channels on airport property are the responsibility of the City of Santa Barbara, with the exception of the existing defined sediment basins.

D. Emergency Contractor Assistance

The County will have contacted a variety of contractors, including crane and trucking vendors, and will have equipment identified and possibly pre-staged to assist in response efforts.

These contractors will be an integral element of the winter emergency response.

III. Debris Disposal Sites

It is probable that an enormous amount of debris and sediments will be excavated from channels, basins and other facilities in the first years following the Gap fire. Two types of debris are expected: woody vegetation and sediment. When these materials are excavated, disposal often becomes the largest obstacle to continued operations. To address the need for rapid debris disposal, two key locations for debris disposal have been identified.

A. Goleta Beach – Sediment Disposal

The shear volume of sediment that is expected to be excavated requires the use of Goleta Beach for disposal. Tens of thousands of cubic yards are expected to be removed from sediment basins, and adequate space does not exist on site to store the material. Goleta Beach is the only feasible alternative. Goleta Beach has been used for sediment disposal in many previous flood emergencies (1995, 1998, 2001, and 2005) and is the recipient of sediment excavated during routine maintenance projects.

The disposal of material at Goleta Beach benefits the beach by nourishing the beach and helping to protect it from erosion. Sediment is placed in the surf zone, allowing waves to redistribute the sand. Sediment that comes to Goleta Beach via excavation projects has a higher sand content than that delivered by the creek systems themselves because coarser sand typically settles out of the water column upstream of the beach.

B. Lake Los Carneros – Woody Debris Disposal

Cleaning of debris racks may generate a large volume of vegetation that cannot be stockpiled on site. Working with the City of Goleta, the property at Lake Los Carneros will be used to temporarily store the material. County Public Works will later mobilize a portable grinder to make mulch out of the material which will then be made available to the public.

Locations of these disposal sites are shown in Appendix D.

IV. Emergency Sand Bag Station

The County has partnered with the City of Goleta to establish an emergency sand bag distribution station in close proximity to the downstream affected areas. The station will be located at Fire Station 14 at 320 Los Carneros Road in Goleta. Sand and bags will be made available to affected downstream property owners. If feasible, an initial supply of filled sand bags may be made available.

V. Assistance to Affected Agriculture Land Owners in and Below the Fire Area

The County has made dedicated staffing available to assist individual agricultural land owners with preventative work. The County will coordinate activities with private land owners, assist with permitting of projects proposed by the land owners, coordinate access to their property by the County to undertake work, and coordinate communication between land owners and the NRCS.

VI. Agency Coordination / Responsibilities

Following the fire, the County has coordinated with a variety of agencies. As with the Zaca Fire in 2007, a series of weekly inter-agency coordination meetings will take place beginning August 11th and will carry into the fall. An Emergency Action Plan (EAP) is also planned. The EAP will provide a comprehensive contact list of agencies, including 24-hour emergency contact numbers. Respective roles and responsibilities will be outlined to provide continued coordination into and throughout the winter.

The following is a list of agencies that have or will be contacted.

AGENCY	**RESPONSIBILITIES**
City of Goleta	City Streets, bridges/culverts, public information, majority of residents live in the City, operations coordination, disposal
City of Santa Barbara	Operates the airport, maintenance of channels downstream of sediment basins, provide security for desilting operations on airport, City streets, bridges and culverts
Caltrans	US 101 including bridges and culverts
US Army Corps of Engineers	Coordination of permit process, emergency direct federal assistance
US Forest Service	Prepared post-fire report (BAER Report), post-fire treatment of federal lands

Natural Resources Conservation Service	Provides emergency funding under EWP program
California Dept of Fish & Game	Emergency permitting
County OES	Emergency response coordination, Operational Area
State OES	Emergency response, State assistance
County Parks	Emergency sediment disposal – Goleta Beach

VII. Funding

Funding for the actions outlined in this plan will be from a variety of sources. The County has requested federal assistance from the Natural Resources Conservation Service (NRCS). The NRCS has provided funding through its Emergency Watershed Protection (EWP) Program after past fires such as the Painted Cave Fire and the Marre Fire. The County requested funds from NRCS following the Zaca Fire; however, no funds were available at that time.

NRCS can provide 75% of approved project costs, subject to funding, and if approved by the State, State OES can provide a portion of the 25% local match. County matching funds for the watershed response projects will come from the Flood Control District, and additional funds for other projects and winter operations will be provided by the City of Goleta, City of Santa Barbara, and Caltrans. The local share of aerial hydromulching will be shared equally by Goleta, Santa Barbara, and the County (and possibly State OES).