

# **FREEWAY COMPLEX FIRE PRELIMINARY REPORT**



**December 2, 2008**

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# *Freeway Complex Fire*

## *Preliminary Report*

### **Purpose**

November 2008 Southern California was devastated by wildland fires. On November 13, 2008 several large fires were burning and being fueled by an extreme Santa Ana wind condition and low humidity. In the aftermath, hundreds of homes were destroyed and thousands of acres burned in Santa Barbara, Los Angeles, Riverside, San Bernardino, and Orange Counties. In total, the fires in Southern California consumed over 850 homes, and burned more than 40,000 acres.

At the request of the Yorba Linda City Council, the preliminary report on the November 15, 2008 Freeway Complex fire is being provided. The comprehensive Freeway Complex Fire After Action Report (AAR), which will be more thorough and detailed, is expected to be completed prior to the March 2009 OCFA Board of Directors (BOD) meeting. A draft of this report will be presented to the Yorba Linda City Council for review and comment prior the final report being submitted to the OCFA Board of Directors. In addition, OCFA staff will provide monthly AAR progress reports to the City Council.

### **Conditions at Time of the Fire**

A Red Flag Warning was in effect for the 24-hour period preceding the start of the Freeway Fire on Saturday, November 15, 2008 and had been extended through 10:00 A.M. for an area including Orange County by the National Weather Service (NWS). This decision by the NWS is based on local weather data and is an important planning triggering event for the OCFA. The Weather Condition Summary contained in this preliminary report comes from climatic archives taken from the two closest National Oceanic and Atmospheric Administration (NOAA) certified Remote Automated Weather Stations (RAWS) to the origin of the Freeway Fire; Fremont Canyon and the Corona Airport. The RAWS provides hourly weather information by collecting, storing and forwarding data to computerized systems. Several indicators are measured including air temperature, local wind speeds and relative humidity around the clock.

The Fremont Canyon (RAWS) site is located on a Santa Ana Mountain ridge above the origin of the fire.

Freemont Canyon RAWS - Santa Ana Mountains

Time	Temperature	Wind Speed	Humidity
9:00 A.M.	75°	43 mph, Gusts to 61 mph	8%
3:00 P.M.	80°	25 mph, Gusts to 45 mph	7%

The second RAWS is located at the Corona Airport and is approximately 3 miles east of the fire's origin, near the entrance to Santa Ana Canyon.

Corona Airport RAWS - Santa Ana Canyon

Time	Temperature	Wind Speed	Humidity
9:00 A.M.	83°	20 mph, Gusts to 24 mph	6%
3:00 P.M.	90°	29 mph, Gusts to 37 mph	4%

## Advanced Planning

During periods of extreme weather, OCFA routinely monitors weather forecasts and takes actions commensurate with these forecasts and predictions. OCFA has a comprehensive Standard Operating Procedure (SOP) titled *Extreme Weather Plan Winds/Red Flag and Rain/Floods* (OM 209.13). This SOP provides a standardized operational approach in response to extreme or predicted extreme weather conditions.

Additionally, OCFA has an SOP titled *Red Flag Alert/Hazardous Fire Conditions Program* (OM 209.12). This SOP describes the Red Flag Alert Program which is designed to prevent large fires that may occur as a result of extreme weather conditions and OCFA's actions in response to Red Flag Alerts that are issued by the U.S. Weather Service. Essentially this program is an intensive, cooperative; watch and-warning fire prevention patrol, and public awareness program conducted by local, state, and federal fire agencies in conjunction with private cooperators during periods of extreme fire danger.

In preparation for the expected extreme fire conditions, the OCFA implemented an emergency staffing pattern on November 14, 2008 which included:

- One Type-III Strike Team with 4-person staffing
- Staffing of a second helicopter
- Increased staffing on five engine companies in the wildland interface areas from three to four firefighters each (these are referred to as the "Grey Book" stations)
- An additional fire dispatcher was added to the Emergency Communication Center

At the inception of the Freeway Fire Southern California was already besieged by two other resource intensive wildfires in the counties of Santa Barbara and Los Angeles County. The Tea Fire started on November 13, 2008 and burned through the community of Montecito located in Santa Barbara County. It would ultimately char 1,940 acres, destroy 210 homes, damage 9 others and cost 5.7 million dollars to extinguish. The Sayre Fire started on November 14, 2008 in the community of Sylmar in Los Angeles County. This fire charred 11,262 acres, destroyed 487 homes, 1 commercial building and 146 outbuildings. The cost of fighting this fire was 13.5 million dollars.

As a cooperating member of the California Fire and Rescue Emergency Mutual Aid Plan, the OCFA had three strike teams of engines deployed out-of-county at the start of the Freeway Fire . The mutual aid system is founded on the principle of neighbor helping neighbor. When an emergency is of such a nature that it overwhelms an agency’s ability to manage it on their own, other California fire departments provide resources. The system allows for an orderly escalation and distribution of resource commitment to one or more incidents and from a single resource to several hundred.

During most wildland fires, Mutual Aid resources are requested and assembled in preparation for anticipated strategic actions. However, with wildland fires that rapidly turn into urban interface conflagrations such as the November 2008 fires, planning must make way for rapid initial attack strategies and the immediate deployment of available resources.

<b>November 14, 2008 OCFA Out-of-County Strike Teams</b>	
Tea Fire	One OCFA Type-III Strike Team (9328-C) was committed to the Tea Fire on 11/13/08 at 9:00 P.M.
Tea Fire	One OCFA engine (OES-E303) was committed as part of OES Type-I Strike Team (1830C) to the Tea Fire on 11/13/08 at 11:47 P.M.
Tea Fire	One OCFA Type-I Strike Team (1400-A) was committed to the Tea Fire on 11/14/08 at 3:55 A.M.
Sayre Fire	One OCFA Type-I Strike Team (1402-A) was committed to the Sayre fire on 11/15/08 at 00:40 A.M.

In addition, neighboring MetroNet fire agencies committed three strike teams of engines to the Tea and Sayre Fires and additional OES engines for the OES strike team. This represents a total of 35 fire engines and seven strike team leaders from the OCFA and other Orange County fire agencies assigned to fires outside of the county at the inception of the Freeway Fire. As OCFA resources are committed on a mutual aid response personnel are recalled to staff relief engines to ensure adequate station coverage. Staffing the OCFA’s relief/surge engine fleet, all fire engines sent out of county had been covered either through the use of backfill (10 engines) or by the on-coming shift personnel (5 engines). All the essential station openings had been covered prior to the start of the Freeway Fire.

## **Fire History of the Area**

Yorba Linda has an extensive history of wildland fire due to its location within the Santa Ana Canyon. Weather, vegetation and topography are the significant factors contributing to the rapid spread and impact of wildland fires. Since 1980, the Yorba Linda area has experienced 25 separate wildland fires burning a total of 82,734 acres; events range from one (1) to 19,986 acres. The most notable and devastating of these are the 1982 Gypsum Incident (19,986 acres), the 1980 Owl Incident (18,332 acres), the 1980 Carbon Canyon Incident (14,613 acres) and the 2006 Sierra Peak Incident (10,506 acres). The commonality of each of these larger fires is the Santa Ana Wind and the effect it has on vegetation and fire behavior. The Santa Ana Canyon funnels the wind, increasing its speed and magnifying the effects on the available fuel bed. The

frequency of fire in this area has allowed non-native vegetation of volatile grasses and weeds to become the dominate fuel type.

Pre-planning for emergency events is a familiar concept to the OCFA. Operational plans exist or are under development for many high risk areas. A few weeks prior to the Freeway Fire, in an effort to bring stakeholder agencies (OCFA, LACO, Corona FD, Cal Fire RRU/BDU, San Bernardino CFD, Chino Valley IFD, Anaheim FD, Orange FD, USFS, and South Ops.) together to develop and review operational plans for the wildland urban interface area along the 91 Freeway corridor a table top “gaming” exercise was conducted. This exercise provided chief officers the opportunity to consider fire progression and fire spread potential. Trigger points were also developed with a course of action for each one. This exercise proved to be highly beneficial as some of the first responding officers were participants in the gaming process.

An example of one of these trigger points is demonstrated through actions taken by OCFA Battalion 2 while enroute to the fire. Based upon the radio traffic from the initial attack companies, Battalion 2 ordered two strike teams to report to OCFA Station 53 in East Yorba Linda. The purpose was to get ahead of the fire and place additional engines into Yorba Linda which was in the direct path of the rapidly advancing fire from Corona.

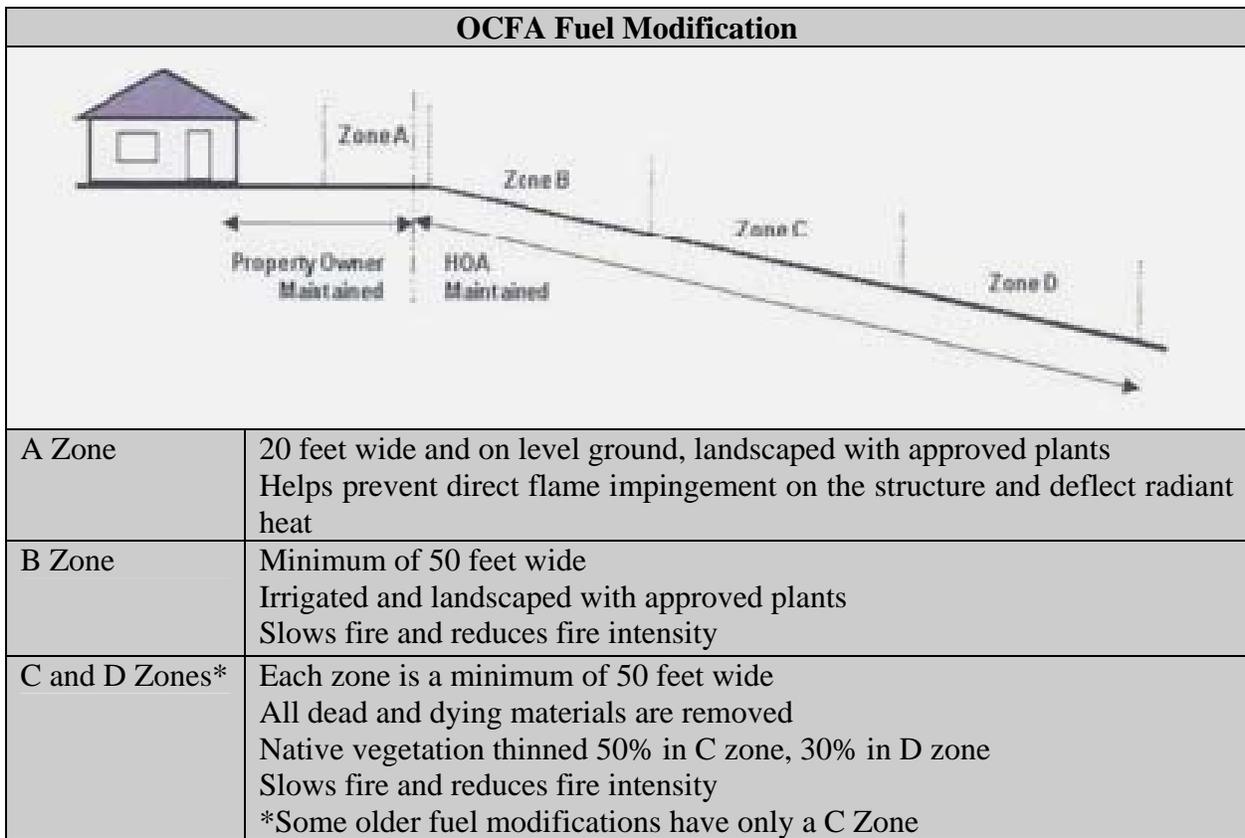
## **Fire Prevention: Brush Clearance and Construction**

Land use planning and fire prevention play a key role in reducing the wildfire threat to communities in the wildland-urban interface (WUI). To adequately protect communities in these areas, a combination of brush clearance measures and ignition resistant construction of structures is necessary.

### **Brush Clearance**

The Orange County Fire Authority has enforced “fuel modification” requirements since the County adopted these provisions in 1979 to protect homes in the WUI. The requirements and provisions are also included in the local ordinances of the 22 cities protected by OCFA. Homes constructed in Yorba Linda since 1980 are most likely protected by a fuel modification program.

Fuel modification is a program consisting of four zones totaling 170 feet in width. Features include: set-backs and irrigated zones along with a selection of appropriate plant palettes for each zone. A 20 foot “non-combustible zone” is included in the yards of homes adjacent to fuel modification areas where fencing, patio covers, decks, etc. must be constructed of non-combustible materials.



Homes constructed in the WUI prior to 1980 are required to maintain “defensible space” between their home and the property line that separates them from the WUI. Defensible space is less prescriptive than fuel modification and consists of thinning vegetation and ensuring tree branches are not within ten feet of chimneys.

The provisions for fuel modification and defensible space have evolved over the past 30 years and, although proven effective in protecting communities during wildfire incidents, are not without implementation challenges. The most significant implementation challenge is maintenance.

### **Maintenance of Brush Clearance**

OCFA does not have a formal WUI inspection program. As a result, if areas are not properly maintained on a voluntary basis by the responsible landowner, they can become overgrown and, in some instances, irrigation can be stopped due to cost or poor maintenance of water lines. OCFA staff attempts to identify the worst cases and work with landowners to restore the land to an approved condition. In Yorba Linda, this is complicated by the fact that, unlike most of Orange County where fuel modification zones are owned and maintained by a homeowner’s association, the OCFA must usually work with each individual homeowner on compliance plans or, in some cases, to access the area for inspection.

In 2008, staff inspected 587 WUI parcels and found only 16 out of compliance with minimum requirements for defensible space. By July 22, all properties were in compliance. In addition, staff inspected approximately 790 of some 950 fuel modification parcels to ensure that they were in “substantial compliance” with provisions of the requirements and found 322 in need of some type of corrective action. As of the date of the fire, all but 25 had met minimum requirements. A preliminary assessment of homes destroyed or damaged in the freeway fire indicates that they were victim to ember intrusion rather than direct flame impingement indicating brush clearance was adequate.

Prior to the fire, staff had made it a priority to conduct a complete inspection of all homes protected by fuel modification to ensure all zones are planted, irrigated and maintained as required. This will be the first comprehensive inspection conducted by OCFA and is expected to take more than a year. This effort may also be combined with an educational component that informs the homeowner of action they can take to protect their home through plant choices outside the fuel modification zones. Information on action that can be taken to prevent fire and embers from entering their homes through open windows, combustibles stacked too close to their home, or inadequate construction features will also be included.

### **Ignition Resistant Construction**

Properly established and maintained brush clearance is typically very effective in protecting homes for direct flame impingement and radiant heat. However, it can do little to nothing to protect homes from ember intrusion. Homes must be constructed to withstand ignition from embers that land on homes or enter through attics and other openings.

The Office of the State Fire Marshal has worked with stakeholders for several years developing “ignition resistant building standards” that were adopted by the California Building Standards Commission and became applicable in January 2008. These standards, which dictate construction methods for roofs, eaves, vents, walls, doors, windows, and patio covers and decks, apply to all homes constructed in “Very High Fire Hazard Severity Zones” or locally designate WUI areas. The State has not yet sent Orange County the final maps for adoption by the City but has indicated they will be mailed early next year. In the interim, the regulations are applicable in the “Special Fire Protection Areas” (SFPA), adopted by the City in 1996.

In 1996, the City also adopted an ordinance for construction within designated SFPA areas. Many construction requirements of that 1996 ordinance are similar to the new statewide standards although notable improvements relative to application and protection of walls and vents were made to the new provisions. It is also notable that, according to our records, none of the homes damaged or destroyed in the Freeway Fire were constructed after 1996 and thus, were not protected by provisions required by the City’s ordinance for WUI areas.

The application of ignition resistant construction requirements is critical to the survivability of homes that are subject to ember intrusion hundreds of feet from the interface. Maps depicting impact areas must be locally adopted.

## **Water for Firefighting**

Brush clearance and “hardened” (ignition resistant) homes go far in improving the chances for a home’s survival from a wind-driven WUI fire. However, intervention by firefighters is often necessary in saving a home that is determined to be defensible. Water is essential to aiding firefighters in these efforts.

OCFA's Planning and Development Services Section reviews all plans for new development to ensure an adequate water supply is provided in accordance with the adopted Fire Code for the city. Like all California jurisdictions, Yorba Linda is required by State law to adopt the California Fire Code (CFC) and adopted the latest edition in 2007. The CFC requires all structures be within a specified distance to an approved water supply. An "approved" water supply can be defined by the adopting jurisdiction or, the adopting jurisdiction may choose to adopt the water supply provisions found in Appendix B of the CFC. At OCFA's recommendation, Yorba Linda adopts Appendix B, which specifies the water supply; know as "fire flow" based on the square footage of the structure and the construction type. Fire flow is comprised of the flow volume (gpm), residual pressure (psi), and duration of flow (in hours). Another table indicates the number of fire hydrants that must supply this fire flow and their spacing relative to structures protected.

## **Incident Summary**

On Saturday, November 15, 2008 at 9:07:37 A.M., the Orange County Fire Authority responded to a 911 cell phone report of a vegetation fire in the area of the west bound 91 Freeway, west of the Green River off-ramp. OCFA’s initial dispatch to the incident was a High Watershed Response, which included the following:

- Two Battalion Chiefs (ORCB2 and ANAB1)
- Seven Engines (ORC E10, E53, E15, E832 and ANA E8, E9 and E10)
- Two Helicopters (ORC HC41 and HC-241)
- Two Patrols (ORC P10 and P32)
- One Fire Bulldozer (ORC Dozer 2)
- One Water Tender (ORC W10)

At 9:01 A.M. the Corona Fire Department received the initial 911 call reporting the fire and had dispatched three engines and one Battalion Chief to a report of a vegetation fire at the west bound 91 Freeway and Green River.

- COR Brush-1, Brush-3, Engine-2 and Battalion 3

After arriving on scene Corona Battalion 3 assumes the Freeway Incident Command. COR B3 reports that the fire is advancing at a rapid rate and is immediately threatening structures.

Even as the initial response was traveling to the incident the OCFA Emergency Communications Center continue to receive a large volume of 911 calls reporting the fire. A total of 711 telephone

calls were handled by the ECC in the first four hours of the incident. At 9:11 A.M. the response is augmented by the following resources:

- One Type III Strike Team (9329C) responding from the RFOTC
- OC Sheriff helicopter (Duke 1)
- One Division Chief (D-5)
- One Hand Crew and the Crew Superintendent (Crew 1)

At 9:19 A.M. while still enroute and having heard the Freeway Incident Commander's report, ORC Battalion 2 uses established trigger points and immediately orders additional resources.

- Two Type-I Strike Team's (1403-A and 1404-A) – These engines were directed to assemble and stage at OCFA Fire Station 53 in Yorba Linda approximately 2.5 miles down wind from the point of origin.
- Two fixed wing aircraft and a lead plane

Within 15 minutes of the original dispatch the following resources had been added to the incident.

- One Battalion Chief (ORC B3)
- One Engine (ORC E221)
- Two Water Tenders (ORC W7 and W16)
- One Patrol (ORC P16/CAFS)
- One Reserve Hand Crew (ORC Crew 18)

**Resources either on scene or ordered within the first 20 minutes of the fire totaled 26 Engines and 5 aircraft**

When Battalion 2 arrived on scene at 9:25 A.M., he met with Corona Battalion 3 and Anaheim Battalion 1. They discussed the fire conditions and spread. By then the fire had grown to over 20 acres with a rapid rate of spread and long range spotting (flying embers) occurring well in advance of the fire. The fire was continuing to spread in a westerly direction towards the Green River Homes development of Corona. Structures had begun to burn in the Penny Royal and Feather River area. All available resources were deployed for structure protection.

It was apparent from the onset that this would become a rapidly spreading and significant fire. At 10:12 A.M. the OCFA Incident Commander (Division 5) called for all highest ranking responding agency chief officers to report to the command post to establish a unified command. The unified command post was established at the Green River Golf Course. The Unified Command Team eventually included the OCFA, O.C. Sheriff's Department (OCSD), Anaheim Fire Department (AFD), Brea FD, LA County Fire Department (LACO), Chino Valley IFD, Corona Fire Department (COR), and Cal Fire.

At 10:14 A.M. Helicopter 41 reports that the main fire has spotted one mile ahead of itself. At 10:20 A.M. ORC B2 instructs the ECC to notify the Brea P.D. and the Yorba Linda City Manager of the risk to homes in the Brush Canyon area and that there is a need to evacuate homes within Thomas Brother's Map Page 741, Grids E4, F4, and G5. B2 reports that the fire

will reach the homes within 30 minutes. B2 orders four additional Type-I Strike Teams to stage at Fire Station 53.

During the first hour of the fire the ECC Supervisor established that the OCFA would be the Central Ordering Point for the fire. ECC dispatchers initiated move-up and cover protocols to fill open fire stations caused by the fire response. The OCFA activated and staffed the Department Operations Center (DOC) in the ECC to manage essential operational functions and to provide assistance to the Freeway Fire Incident Commanders. At approximately 9:30 A.M., Division 3 arrived at the DOC and assigned OCFA personnel to report to the County of Orange EOC on Loma Ridge, the OCSD DOC at the Sheriff’s facility in Santa Ana, and the Yorba Linda EOC in the Yorba Linda Community Center.

**A second vegetation fire is reported in the City of Brea near Carbon Canyon**

At 10:46 A.M. a second vegetation fire is reported in the area of the Olinda Alpha Landfill in the City of Brea. The OCFA dispatch center sent the following units from available resources covering nearby fire stations.

- Two Battalion Chiefs (ORC B1 and B8)
- Four Engines (ORC E817, E47, E62 and E223)
- Two Patrols (ORC P23 w/CAFS and P26)
- One Paramedic (ORC M26)
- One Safety Officer

<b>Olinda Alpha Landfill Fire Timeline</b>	
10:46 A.M.	OCFA receives 911 call
11:00 A.M.	OCFA B-8 arrived on scene reported 2-3 acres moving rapidly toward structures and ordered three Type-I Strike Teams and firefighting aircraft
11:08 A.M.	Units from Brea FD and Fullerton FD are dispatched to the fire. Brea B-1, E-1, E-2, E-3, E-304 Fullerton E-1 and E-4
11:28 A.M.	OCFA and Brea FD form a unified command at the “Dump Fire”
17:17 A.M.	Incident commanders at the Freeway Fire roll the Dump Fire into the Freeway Fire and designate the Dump Fire as Branch III of the Freeway Complex.

<b>Freeway Complex Fire Timeline and Fire Spread Summary</b>	
9:00 A.M.	A vegetation fire is established in the vicinity of the 91 and Green River. Aided by above average air temps and single digit RH, Santa Ana winds push fire through the riverbed vegetation and into the surrounding foothills west and north of Green River Golf Course.
9:25 A.M.	Fire is bumping up against and destroying homes in the city of Corona on Feather River Rd and Penny Royal Rd., east of the golf course.
9:45 A.M.	Fire is immediately threatening the golf course and the order to evacuate is given. Fire is also making a run to the WNW and becoming well established in Chino Hills State Park.
10:04 A.M.	The order is given to the BNS Railroad to stop all rail traffic in the affected area.
10:31 A.M.	Reports of fire running into Brush Canyon and threatening homes in Yorba Linda on Evening Breeze, Blue Ridge and Big Horn.
10:52 A.M.	Reports of homes burning in the area of Paseo de Toronto and Bryant Elementary School.
12:53 P.M.	The fire jumps the 91 Fwy and threatens structures in Anaheim Hills
1:08 P.M.	The fire is now taking structures in Hidden Hills
1:18 P.M.	Structures are threatened on Stonehaven, west of Hidden Hills
2:03 P.M.	Reports of structures on fire in the area of New River and Esperanza, west of Yorba Linda Blvd
3:05 P.M.	Reports of structures on fire in the areas of San Antonio and Alder, north of Yorba Linda Blvd
3:13 P.M.	Reports of homes on fire in the area of San Antonio and Fairmont
3:14 P.M.	Reports of numerous businesses threatened in SAVI Ranch
5:08 P.M.	Homes reported to be burning in the area of Black Forest and Banyan Rim
7:00 P.M.	Cal Fire Incident Management Team. Six assumes control of the fire and continues to support the established Unified Command
7:47 P.M.	Report of fire in the Yorba Linda Blvd and Kellogg area
8:15 P.M.	Fire is now reported to be in Telegraph Canyon and approaching Carbon Canyon
9:53 P.M.	Fire has become established in the area of Lambert and the 57 Freeway

### **Freeway Complex Statistics**

The Freeway Fire burned approximately 10,000 acres in the first 12-hours. After just 24-hours, the fire had consumed 23,640 acres and numerous homes.

- 30,305 acres burned
- 187 Residential structures destroyed (includes multi-family residences)
- 127 residential structures damaged
- 2 commercial properties destroyed

- 2 commercial properties damaged
- 11 outbuildings destroyed
- 32 outbuildings damaged
- \$16.1 million in suppression costs to date, 11/26/08

## Mutual Aid

As signatory to the California Master Mutual Aid agreement, the OCFA provides mutual aid assistance to those communities in need. In the same respect, when the OCFA is in need mutual aid is provided by fire agencies who are able to do so. During the Santiago Fire in 2007, there were nine other major fires in California. This unusual circumstance required the OCFA to be self sufficient for the first 48 hours of that fire.

In contrast, when the Freeway Fire started there were two fires of significance in Southern California; the Tea Fire in Santa Barbara County and the Sayre Fire in Los Angeles County were both well underway and seeking mutual aid resources. Prior to the start of the Freeway Fire the OCFA had sent one Type-III and one Type-I Strike Team. to the Tea Fire. MetroNet cities had sent three Type I Strike Teams along with an OES engine Type-I Strike Team from both OCFA and MetroNet cities to the Tea Fire. The Sayre Fire received one Type-I Strike Team from the OCFA and one Type-I Strike Team from MetroNet.

When the Freeway Fire began there were immediate requests for both Type-I and Type-III Strike Teams beyond what could be provided by local agencies. In total 35 Strike Teams of various types were ordered within the first four hours of the incident. Of these, seven Type-I and one Type-III Strike Teams were filled with resources within Orange County as immediate need requests . By 11:00 A.M. six Strike Teams (5 Type-I and 1 Type-III) had arrived from Riverside County. By 1:30 P.M. a total of 19 Strike Teams and one task force were operating on the complex. This was in additions to the 58 engines, 3 trucks, 8 patrols and 5 water tenders that responded as single increments to the complex in the first four hours of the incident. In total, prior to 2:00 P.M. there were 159 engines assigned to and operating on the Freeway Complex.

This rapidity in which resources were filled is largely due to the lack of competition for resources from other fires and a change in mutual aid policy. This change initiated in 2007 allowed for Operational Area and Region Coordinators to directly order and request up to five Strike Teams across operational area boundaries based on the closest resource concept; this is in contrast to the previous rule that permitted only one Strike Team resource to be ordered outside the regional system.

## Air Resources

At the time of the initial dispatch of the first air resources to the fire on November 15 (9:08 A.M.), winds at the Fullerton Airport were light and blowing offshore. When the crews of OCFA Helicopters 41 and 241 lifted off they noted that the smoke column rising from the fire in Corona was building and beginning to bend with the influence of the Santa Ana wind. As they headed toward the Santa Ana Canyon the flight crews experienced a 20 to 30 knot head wind. Although their airspeed indicated 110 knots, their actual ground speed was only 70 knots. Wind turbulence was a continual factor for the helicopters as they began making water drops in the interface where the fire was threatening residences. The low lying smoke challenged the pilots' ability to maintain visual flight conditions while making concentrated, effective drops.

The initial aircraft response consisted of OCFA H-41, H-241 and OCSO Duke-1. Duke-2 was later added to the response to assist with water dropping missions. Both OCFA helicopters arrived on scene at the fire at 9:29 A.M. and began dropping water on the fire near the threatened homes. Duke-1 arrived shortly afterward. Because the Sheriff's helicopter does not have a fixed water tank, Duke-1 must land and deploy their 170 gallon bucket prior to engaging in the firefighting efforts.

While engaged in fire fighting, a Corona City Fire crew was overrun by the rapidly escalating fire front. With the fire environment becoming untenable OCFA flight crews began making water drops on the firefighters' position. The firefighters sustained minor injuries. A burn over investigation was initiated by Cal Fire.

At 9:19 A.M. ORC Battalion 2 ordered "Fixed wing aircraft" which resulted in the dispatch of two S2T Air Tankers and an Air Attack out of San Bernardino. The first fixed wing assets arrived at 10:10 A.M. and at the direction of Air Attack began making drops along the North flank of the fire. At 10:24 A.M. ORC HC 41 relayed a resource request from Air Attack to OCFA dispatch "For three additional Air Tankers with a Lead Plane and four Type 2 helicopters."

The Freeway Complex eventually had 17 fire fighting helicopters assigned. These helicopters were comprised of local and state government fire helicopters, law enforcement and commercial venter *call when needed* (CWN) aircraft. During the first six hours of the fire, the OCFA helicopters dropped 48,400 gallons of water and fire retardant foam on the fire. By the end of the second day they delivered over 88,000 gallons of water and foam during water dropping missions on the Freeway Complex. During that same two day period, twelve fixed wing Air Tankers with four Lead Planes being fueled and re-supplied out of San Bernardino and Hemet Ryan air bases dropped 208,791 gallons of retardant on the fire. Tanker 910 (DC-10 aircraft) made a total of ten drops (8 on 11/15 and 2 on 11/16) in the Yorba Linda/ Chino Hills area for a total of 109,445 gallons of retardant. This availability of air resources is also in contrast to the Santiago Fire, where much of California's airborne fire suppression ability was engaged in the numerous other fires in place when the Santiago Fire began.

## **Water Supply**

The demands of a single structure fire can tax even a well functioning water system. In contrast to the usual situation where an engine will pump directly from a hydrant to fight a structure fire, in a wildland event the hydrants are used to refill the water tenders and the engine water tanks. The engines then usually use their tank water to attack the fires during their mobile suppression efforts. As ground forces moved into threatened neighborhoods and tried to extinguish or defend dozens of homes, the Yorba Linda water supply was severely impacted. At approximately 2:00 P.M., several radio calls were received reporting fire companies encountering low or no water pressure in various sections of the Hidden Hills area. Fire companies encountered low or no water pressure on Hidden Hills Road, Mission Hills Lane, High Tree Circle, Fairwood Circle, Green Crest Drive, Skyridge Drive and others. With homes burning on multiple fronts Strike Team Leaders directed companies to move to areas that had available water.

In an effort to ensure that rekindles were kept to a minimum a Patrol with Compressed Air Foam System (CAFS) Task Force was established and put under the direction of a Battalion Chief. The Task Force remained in the Hidden Hills area extinguishing fires and laying down protective foam on unburned structures.

The Yorba Structure Protection Group was using two water tenders to shuttle water to the fire companies. The water tenders systematically began checking fire hydrants until one was found that had enough pressure to fill the water tanks. Eventually water tenders had to fall back to the hydrants at the lowest point in the system to refill. A request for service was placed to the Water District via the Yorba Linda EOC at approximately 2:00 P.M. The Water District responded into the area quickly but was unable to immediately determine the reason for the pressure loss, resulting in the service not being restored for some time. At approximately 5:00 P.M. the water tenders found that the pressure had improved sufficiently enough to permit filling. Also at 5:50 P.M. the Yorba Linda Water District requested three fire engines to assist them in supplementing the water grid system at Pepper and Manzanita.

## **Evacuations**

The Freeway Fire raced from Riverside County on forty to fifty mile per hour winds into the City of Yorba Linda. At approximately 10:20 A.M. the OCFA ECC received direction from OCFA Battalion 2 to advise the City of Yorba Linda that evacuations should be initiated in the areas of Brush Canyon and that the fire would be upon those homes within thirty minutes. Within 90 seconds the Brea PD was notified to initiate the evacuations and the City Manager was contacted. At 10:31 A.M. the first reports are received that the fire is spotting and homes are threatened on Bighorn Mountain Way in Yorba Linda. At 10:39 A.M. OCFA Helicopter 41 confirms that homes on Bighorn Mountain Way, Blue Ridge Drive, and Evening Breeze Drive are threatened.

Although a collaborative decision, the responsibility for civilian evacuation is statutorily a law enforcement function, which also allows the fire department to focus on control efforts. It is impossible to know how many citizens evacuated at any one time in any single area of the city; however it is known that nearly 9,000 dwelling units were impacted in Yorba Linda by the evacuation order as a result of the fires that comprised the Freeway Complex. It is estimated that at the height of the firefight approximately 24,000 citizens were evacuated or kept from returning to their homes due to safety concerns.

As residents began to evacuate, traffic grid-locked in some areas as emergency apparatus tried to enter the neighborhoods while residents tried to exit. The Brea Police Department and other assisting law enforcement agencies took control of the traffic flow which helped firefighters gain access to threatened homes. In any firefighting effort rescue is the first priority. However, in this case resident self evacuation was in effect assuring that rescue from an active fire front would be minimized. It is noteworthy that with such an expansive and escalating evacuation boundary the residents stayed calm and followed evacuation directions. At 11:30 A.M. Patrol 10 reported to incident command that evacuations in their area were orderly and without incident.

Law enforcement agencies possess the legal authority to conduct evacuations of populated areas. Although a mandatory evacuation was declared, law enforcement does not have the legal authority to force residents out of their homes; however, law enforcement may restrict the return of residents once they leave. Determining where and when to evacuate is often difficult. Each decision brings with it a new set of risks and benefits. The greatest risk by permitting residents to remain with their homes is the potential for loss of life. The fact that there was no loss of life or serious injury to residents should not go unnoticed.

Similar wildland urban interface fires in other communities have not been so fortunate. The Tea Fire in Montecito resulted in more than two dozen civilian injuries, two of which were critical burns received while trying to flee their residence. In 2006, in Cabazon, the Esperanza Fire resulted in four firefighter fatalities that occurred during structure protection efforts. The Cedar Fire that occurred in San Diego County in 2003 resulted in the death of fourteen civilians and a firefighter all while trying to flee or protect homes. Investigation into the citizen deaths and injuries identified one commonality: they all occurred because people decided to stay and protect their property or they evacuated too late and got caught in the fire front.

Although there was no loss of life in Yorba Linda, there may have been close calls. The following was put into the call history by an OCFA dispatcher during the fire.

“Wife called to report her husband is trapped somewhere in the Yorba Linda Fire. He was working in the area and started to hose down houses then became trapped. She was unable to give any type of location. She was advised to keep trying to contact her husband to find out his location. He is not answering his cell.”

We do not know who this man was or what impact his efforts may have had. What we do know is that he found himself at risk and may have faced serious injury or death. We also know that because the call came into the ECC, firefighters on the line were notified to be alert for trapped

civilians. Having to focus the already limited resources on both firefighting and potential rescue situations does impact the efficiency of the emergency operations.

Recently the OCFA held a summit for Southern California fire officials to discuss a program designed to help communities better prepare residents of wildland urban interface areas. This program is named *Leave Early or Stay and Defend* (LEOSAD) and is a development of the Australian fire service. The OCFA is evaluating the viability of this program. A key premise of LEOSAD is that residents have a vested interest in protecting their property in the face of a catastrophic fire event. It also reinforces that these urban conflagrations are beyond the ability of a fire agency to control with initial response resources and that triage decisions must be made as to which structures to defend.

Wildland urban interface fires present many challenges pertaining to evacuation. The fire spread rate is often so fast that emergency responders can only estimate the rate of spread and direction of travel. In this case, within minutes of the fire start, spotting was reported one mile down-wind from the head of the fire. Driven by winds of 40 MPH and higher the rate of spread went from the usual estimate of acres per hour in a non wind driven fire to acres per minute.

Recent simulation training for a fire along the 91 Freeway corridor gave incident commanders some practical trigger points when and where to call for evacuation. Radio traffic supports that when these trigger points were reached planned actions were put into motion. The manner and timeliness in which residents were notified is being reviewed. After the Santiago Fire in 2007 the County of Orange led the development and implementation of a public notification/alert system called *AlertOC* which has been adopted and activated in many cities throughout the county.

The City of Yorba Linda is in the process of implementing AlertOC and plans to use the system to communicate to Yorba Linda residents and businesses affected by local emergency events. Residents may use the online process to register their contact information. AlertOC is designed to be implemented by designated city officials during an emergency.

Triaging of homes in regard to an urban conflagration is very similar to what a paramedic would do for a mass casualty incident. Triage is to allow the organization to do the most good for the greatest number of people when the available resources do not match the need. This same goal applies to the triage of structures in a wildland urban interface fire. Fire personnel are trained to recognize which structures are least-salvageable and then to direct their efforts toward saving those structures that have the greatest potential to be saved. However even with the best training and practice it takes great discipline to trade off the life of one patient for another, just as it takes the same discipline to drive past a structure that is on fire to defend one that is not. These triage decisions are often made in seconds with little more information than firefighters can gather as they drive down a smoky and ember ridden street.

## Investigation

The fire originated in Riverside County near the 91 Freeway and the Green River off-ramp in the City of Corona. The area of origin is the jurisdiction of Cal Fire. Cal Fire investigators assumed the responsibility for the fire investigation. The preliminary fire cause is reported as accidental; the result of a vehicle exhausts system igniting roadside vegetation. The Landfill Fire is also currently under investigation.

## Cost and Reimbursement

Annually the OCFA establishes *Cost Reimbursement Rates* for personnel and equipment resources that are requested on an *Assistance-by-Hire* basis by local, state and federal agencies seeking OCFA services. The personnel rates are based on budgeted salary and benefit costs and also include indirect costs such as financial services, purchasing, and human resources. Equipment rates are based on rate schedules provided by Cal Fire and the Federal Emergency Management Agency (FEMA). To date the cost for the Freeway Complex Fire is estimated at \$16.1 million dollars.

Within the first hours of the fire, a Federal Management Assistance Grant (FMAG) was submitted for each of the Freeway and Landfill fires. Both were subsequently approved. Due to the magnitude of the incident, FEMA and the State's Office of Emergency Services (OES) declared the Freeway Complex Fire as a Major Incident. This made Public Assistance Funding available to the participating agencies.

The OCFA is responsible for a small percentage of the cost of fighting the fire on the first day. Cal Fire will assume the remaining firefighting costs.

## Recovery

Even as the Freeway Complex Fire was being brought under control, efforts began to address the post fire risk to lives and property that could arise during the coming rainy season. The combined effects of vegetation loss and the effect on soils from fire, created conditions that greatly increased the threat of flooding, erosion, and debris flow in the impacted areas.

In order to prepare for the winter season, the OCFA along with the California State Office of Emergency Services (OES) coordinated assessments of the burned areas with State Emergency Assessment Teams (S.E.A.T.). These teams were made up of representatives from CAL FIRE, California Geological Survey, Department of Water Resources, Department of Fish and Game, Department of Parks and Recreation and Regional Water Quality Control Boards.

The S.E.A.T. members conduct a rapid assessment of the fire area to identify hazards and subsequent mitigations including:

- Identifying on-site and downstream. threats to public health or safety from land sliding, debris torrents, flooding, road hazards, and other fire related problems.
- Identifying threats to watershed resources, including: excessive erosion; impaired water quality; threats to wildlife, fisheries, and botanical values; and cultural resources.
- Determining measures needed to prevent or mitigate identified threats.

The report provided by the S.E.A.T. members suggests mitigations that can be used to reduce but not entirely eliminate all risk from the identified hazards. Some possible recommendations:

- Straw mulching and erosion control fabric or blankets
- Straw wattles to provide a mechanical barrier to water flow and trap sediment
- Hydro-mulching in selected areas

Any recommended mitigations will normally be implemented by private, local, state and federal agencies. The S.E.A.T. has no control over the implementation of the mitigations.

## **Rain Event**

A moderate to heavy rain storm was predicted for the Orange County area on November 26-27, 2008. Predicted rainfall amounts ranged from 1.5 inches to 2.5 inches. The OCFA began preparations for the possibility of mud and debris flows by working closely with the local communities of Yorba Linda, as well as the Santiago Fire areas. Evacuation plans were coordinated with local government and law enforcement agencies in the areas directly impacted by the fires.

The three main objectives for the OCFA were to provide incident management and support in the event of significant flooding and debris flow in the burn areas. Second, to coordinate weather related calls for service to the city of Yorba Linda if the call volume were to overwhelm the OCFA's Communication Center. And third, to assist with the timely and orderly evacuation of residential areas as necessary.

The following OCFA resources were pre-staged in order to reduce reaction time and get needed help to any impacted areas as soon as possible. The augmented resources were staged at the Yorba Linda Community Center.

- Incident Management Team
- One Dozer
- Two Swift Water Rescue units
- One Hand Crew
- One Type 3 Strike Team
- Reserve Patrols 10 and 32

The City of Yorba Linda and its residents played a significant role in preparing for the rain event. Even while fire crews were continuing to overhaul the burn areas, community efforts were underway to fill, distribute and place sandbags, straw bales and other mitigation efforts.

## **Incident Summary**

On November 15, 2008 the Cities and Communities of Yorba Linda, Corona, Anaheim, Brea, Carbon Canyon, Diamond Bar, and Chino Valley were tested by fire. In short the residents and businesses in the affected areas were victim of an urban conflagration. What has become a common occurrence in Southern California this dramatic and damaging fire known as the Freeway Fire Complex focused its full fury into residential neighborhoods that once enjoyed panoramic views of the urban wildland interface (WUI). Fanned by Santa Ana winds this fire grew from a roadside start in light grasses to a consuming furnace moving faster than ground forces were able to predict. Analogous to taking a bag of confetti, lighting it on fire and tossing it in front of a high powered fan; showers of embers rained down without discrimination.

Pushed by winds greater than 40 mph, fueled by single digit relative humidity and in alignment with favorable terrain the Freeway Fire capitalized on these key burn factors to consume more than 30,000 acres, destroy 200 structures, and damage 161 others at a cost of more than 16.1 million dollars.

Initiating a unified incident command structure the OCFA with the assistance of more than 276 mutual aid agencies fought back for five days to gain control and then spent several more days to ensure that every open fire line was closed and every burned structure was overhauled. Combining a well coordinated ground attack with a military like air assault every effort was made to protect homes, businesses and infrastructure while ensuring public safety as best as possible. In the end, properties were lost and damaged, and while devastating, satisfaction must be found in that no lives were lost and only a few minor injuries were reported. In that satisfaction the OCFA recognizes that even the loss of one home is unacceptable and has already begun the organizational learning process.

This preliminary report is the precursor to a more formal and detailed After Action Review. Staff has already been assigned to manage the process and the goal has been established to have the finished report ready by March 1, 2009. Regular updates will be provided to the Yorba Linda City Council as the report is developed. The OCFA will not be waiting for the final report to initiate needed changes or action items. For instance, the OCFA had initiated the process of subscribing to the Alert OC public notification system and will work with the City of Yorba Linda, other partner cities, and law enforcement agencies to ensure systems and processes are reviewed and established that will ensure prompt public notification of emergency situations.

The OCFA understands the concern in regard to ensuring an adequate water supply is available and accessible for fires and other emergencies. In that regard the OCFA has already initiated meetings with the Yorba Linda Water District to determine the nature and cause of water delivery issues related to the Freeway Fire. As soon as practical the OCFA will initiate discussion with other municipal water districts and city water departments. The focus of these

meetings will be to determine how water agencies can work together to enhance service during emergencies.

As previously discussed in this report the OCFA has already initiated action toward future implementation of the “Leave Early or Stay and Defend” (LEOSAD) program. Understanding that homeowners have a vested interest in the protection of their property, the OCFA desires to provide a proven methodology that will meet that goal while making safety of the homeowner a key principle. In that regard, the OCFA will work with the City of Yorba Linda and community leaders to develop educational methodologies and vendor resources to ensure that the LEOSAD philosophy is widely disseminated and supported.

Furthermore as the recovery process begins the OCFA is committed to ensuring that those residents and business owners who sustained either a wholesale loss or even the most minor of damage receive the assistance most needed. Fire Prevention personnel are ready to assist in every phase of the recovery. OCFA Fire Prevention staff will work with the City of Yorba Linda Building Department to streamline permit and plan check processes. The OCFA’s Fire Marshal has initiated an assessment of the damage relative to brush clearance and building construction and will review existing codes and ordinances. Working with City staff, they will make recommendations to City Council on revisions that will better protect homes from flames and ember intrusion.

The OCFA has provided this preliminary report to meet the need and request of the City of Yorba Linda. While not able to provide final and determinant information at this early phase of the incident review, it is sincerely hoped that the information contained herein has been satisfactorily developed and presented.

## Glossary of Terms

**CONFLAGRATION** – An uncontrolled burning or fire that threatens human life, property and the environment.

**CONTAINMENT** – A fire is contained when it is surrounded on all sides by some form of boundary, line or clearance, but is still burning and has the potential to jump or escape the containment line.

**CONTROLLED** – A fire is controlled when there is no further threat of it jumping or escaping outside the containment line.

**COOPERATING AGENCY** – An agency supplying assistance including but not limited to direct tactical or support functions or resources to the incident control effort.

**DEFENSIBLE SPACE** -Creating a fire safe landscape for at least 30 feet around homes (and out to 100 feet or more in some areas), to reduce the chance of a wildfire spreading to structures. This is the basis for creating a “defensible space” - an area that will help protect a home and provide a safety zone for the firefighters battling flames.

**DEPARTMENT OPERATIONS CENTER (DOC)** – Also known as “Expanded Dispatch”. A DOC provides agency dispatching capability independent and separate from routine emergency dispatch. The DOC is activated and staffed for large or complex incidents allowing personnel to focus efforts solely on the incident, maintaining situation status, processing orders for resources and maintaining a direct link with EOCs.

**ECC** – Emergency Communications Center. Also known as a Dispatch Center, an ECC is the center of an agencies information and communication capability tasked with receiving and processes incoming calls for help. ECC personnel determine the nature of the request and forward it to the appropriate resource.

**EXTREME FIRE BEHAVIOR** – “Extreme” implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: High rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, and dangerously.

**FIRE LINE** - A strip of area where the vegetation has been removed to deny the fire fuel, or a river, a freeway or some other barrier which is expected to stop the fire. Hose lines from fire engines may also contribute to a fire being surrounded and contained.

**FIRE PERIMETER** – The entire outer edge or boundary of a fire.

**FMAG** – Fire Management Assistance Grant. A federal assistance program managed by FEMA through the state Office of Emergency Services (OES). This program is designed to help state and/or local jurisdictions impacted by high cost, high damage wildland fires.

**FUEL MODIFICATION** – The practice of modifying and irrigating vegetation to reduce fuel energy output. Highly flammable wildland vegetation is replaced with managed areas of light or fire resistive fuels thereby allowing firefighters the ability to control a fire while relatively small.

**FUELS** - Combustible material.

**GREY BOOK** – The Gray Book is the agreement between Cal Fire and the six contract counties that addresses direct fire protection of State Responsibility Area (SRA) within each of the contract counties. Orange County, along with the other contract counties receives funding from the state to provide protection to the SRA

**HANDCREW** – A team of wildland firefighters primarily assigned to fire line construction activities. Handcrews also mop up hot spots; burn out vegetation to provide fuel free zones and assist with hose lays.

**INCIDENT COMMANDER** – This ICS position is responsible for overall management of the incident and reports to the Agency Administrator for the agency having incident jurisdiction.

**INCIDENT COMMAND SYSTEM (ICS)** – A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries.

**INCIDENT MANAGEMENT TEAM (IMT)** – The incident commander and appropriate general and command staff personnel assigned to an incident. Also known as an Incident Command Team.

**INITIAL ATTACK (IA)** – An aggressive suppression action taken by first arriving resources consistent with firefighter and public safety and values to be protected.

**INTERFACE ZONE** – It is the area where the wildlands come together with the urban areas. Also referred to as the I-Zone. Also referred to as Wildland Urban Interface (WUI)

**MASTER MUTUAL AID SYSTEM** – Master Mutual Aid creates a formal structure in which a jurisdictions personnel, facilities and equipment can voluntarily assist other jurisdictions when their capabilities are overwhelmed.

**OES** – The California Governor’s Office of the Emergency Services.

**PATROL UNIT** – An OCFA fire apparatus designed for wildland firefighting built on heavy duty passenger crew-cab truck chassis and carries 100-gallons of water in a pressurized tank. OCFA Patrols are assigned to fire stations adjacent to wildland interface areas.

**RATE OF SPREAD (ROS)** – The relative activity of a fire as it extends out from the point of origin and the total perimeter of the fire. It is usually expressed in acres per hour.

**SANTA ANA WINDS** – Is a type of Foehn wind. A Foehn wind is a warm, dry and strong general wind that flows down into the valleys when stable, high pressure air is forced across and then down the lee side slopes of a mountain range. The descending air is warmed and dried due to adiabatic compression producing critical fire weather conditions. Locally it is called by various names such as Santa Ana winds and Sundowners.

**SEAT TEAM** – State Emergency Assessment Team (SEAT). A team comprised of multi-agency and multi-disciplined resource specialists assembled to assess fire damage, suppression effects and prepare mitigation measures. Upon development of a rehabilitation plan, the team makes recommendations on hazard mitigation.

**STRIKE TEAM** - An engine strike team consists of five fire engines of the same type and a lead vehicle. The strike team leader is usually a captain or a battalion chief. Strike Teams can also be made up of bulldozers and handcrews.

**SPOT FIRE OR SPOTTING** – A small fire that is ahead of the main fire, caused from hot embers being carried (generally by winds) to a receptive fuel bed or structure. Spotting indicates extreme fire conditions.

**RED FLAG WARNING** – Term used by fire weather forecasters to alert users to an ongoing or imminent critical fire weather pattern.

**REHABILITATION** – The activities necessary to repair damage or disturbance caused by wildfire or the wildfire suppression activity.

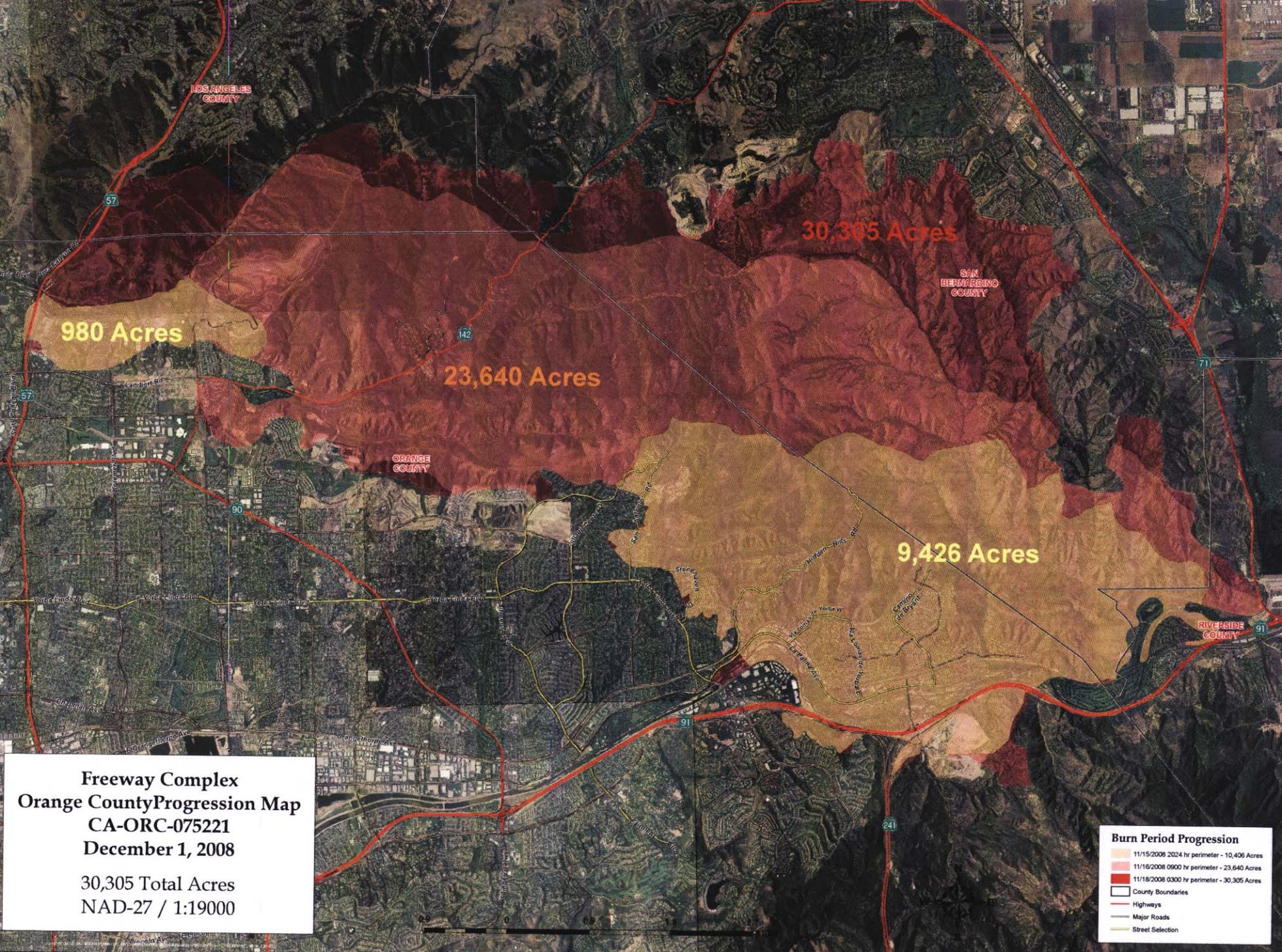
**STATE RESPONSIBILITY AREA (SRA)** - The California Board of Forestry and Fire Protection classifies areas in which the primary financial responsibility for preventing and suppressing fires is that of the state. CDF has SRA responsibility for the protection of over 31 million acres of California's privately-owned wildlands.

**UNIFIED COMMAND** – In ICS, unified command is a unified team effort which allows all agencies with jurisdictional responsibility for the incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives and strategies.

**WATER TENDER** – A specialized firefighting apparatus capable of transporting a minimum of 1000 gallons of water from a water source directly to the fire scene.

**WILDLAND ENGINE (Type III)** – Fire engines designed for the wildland firefighting environment. Constructed on heavy-duty commercial truck chassis with high ground clearance and often equipped with four wheel drive. Type III engines carry 500 gallons of water and have a minimum pump capacity of 120gpm at 250psi

**WILDLAND/URBAN INTERFACE** – The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.



980 Acres

23,640 Acres

30,305 Acres

9,426 Acres

LOS ANGELES COUNTY

SAN BERNARDINO COUNTY

ORANGE COUNTY

RIVERSIDE COUNTY

**Freeway Complex**  
**Orange County Progression Map**  
**CA-ORC-075221**  
**December 1, 2008**  
 30,305 Total Acres  
 NAD-27 / 1:19000

**Burn Period Progression**

- 11/15/2008 2024 hr perimeter - 10,406 Acres
- 11/16/2008 0900 hr perimeter - 23,640 Acres
- 11/18/2008 0300 hr perimeter - 30,305 Acres
- County Boundaries
- Highways
- Major Roads
- Street Selection