

**Natural Hazard Mapping, Analysis, and Mitigation:
a Technical Background Report in Support of the Safety Element
of the New Riverside County 2000 General Plan**

CHAPTER 4: WILDLAND FIRE HAZARDS

4.1 Overview

Major wildland and earthquake-induced fires can overwhelm local emergency response resources and are an ongoing threat in Riverside County, which has suffered six fire disasters since 1970. This study rates much of the County as potential wildland fire area, a finding that is in agreement with the State of California Department of Forestry and Fire Prevention. In such areas, special State statutes govern development, property owners must do preventative maintenance, and, in general, planning and preparedness are required to avoid disasters.

Wildland fire, also called chaparral or brush fire, is typically associated with the indigenous vegetation in the mountain and foothill areas of southern California. This vegetation has a very high oil content that creates severe fire danger. Wildland fires can also occur in suburban and rural areas of the County, which juxtapose developed lands with uncultivated lands, undeveloped lands, timber, range, watershed, brush or grasslands.

At present, more than 8 million people have homes and businesses in California's wildland areas. In Riverside County, as elsewhere, more people than ever are living and playing in wildland intermix areas. Wildland-urban interfaces create extremely dangerous and complex fire conditions which pose a tremendous threat to public and firefighter safety. Often, as wildland fires meet structural developments, vegetation ceases to burn but catastrophic fire continues, for a mile or more, sustained by structures igniting.

Wildland fire is a serious and growing hazard, posing a great threat to life and property, particularly when it spreads into developed areas. However, wildland fire is also a natural process. In the past, the presumption has been that all fire is bad and should be extinguished promptly. This has caused fire-starved vegetation to grow more dense, which weakens vegetation in a struggle for living space and increases destruction by pests and disease. Dead and dying plants add fuel for fire. In addition, in many areas, the absence of fire has altered or disrupted the cycle of natural plant succession and the wildlife habitats. Recognizing this, land management agencies are now committed to finding ways, such as prescribed burning, to reintroduce fire into natural ecosystems, while acknowledging the continued importance of fire-fighting and suppression.

Fires in fire-starved areas burn more intensely. They are more costly to control and create greater risk of losses to the people, resources, and improvements in wildland areas. In addition, many other factors are contributing to make wildfires hotter and more destructive.

California has extended droughts, which increase dead and dying vegetation, volumes of dry fuel per acre, and the number of days of low humidity. Federal policy that sets aside federal lands, without an aggressive pre-fire management program, further limits fuel management and adds ignition sources. Then, in many portions of Riverside County, fire danger can be worsened by steep, rugged topography, which allows wildland fire to spread quickly and makes it more difficult to fight.

Santa Ana winds greatly increase fire danger. Named by the early settlers at Santa Ana, these hot, dry winds typically develop when a strong, but stalled, high-pressure system near Idaho and Salt Lake (the Great Basin High) meets a weak, low-pressure system just off shore in southern California (Chen, 2000). In these conditions, the easterlies (winds from the east) are turned north and south, where they are channeled and thus strengthened by the many canyons in the Great Basin. The result is hot, powerful, and very dry winds that blow across southern California, especially through the mountain passes.

The greatest demands on fire suppression resources occur when there are multiple ignitions. Thus, widespread fires following an earthquake, coupled with Santa Ana winds, constitute a worst-case fire suppression scenario. Because of dry vegetation and recurring Santa Ana winds, the fire danger for Riverside County is considered extremely high during 25% of each year, throughout the months of August, September and October. Because of many large, active faults in Riverside County, the probability of a major earthquake is high, year-round. Therefore, there is a statistically significant chance that this worst-case fire suppression scenario could occur.

The Oakland Hills fire of October, 1991 (the "Tunnel" fire, Table 4-1) demonstrates the seriousness of multiple ignitions. The Oakland Hills fire was a firestorm. When fires grow into firestorms, we have catastrophes. Insurance companies define a catastrophe as an event that triggers at least \$25 million in claims or more than 1,000 individual claims. Riverside County may develop a different definition. Regardless of such fine points, the Safety Element of the General Plan exists to avoid such incidents.

During the Oakland Hills fire, numerous single- and multi-family residential structures were simultaneously ignited by burning cinders that were fanned by winds. In this mode of fire spread, termed "branding", wind can transport burning cinders a mile or more. Roofs are the most vulnerable portion of a building or structure to branding. Wood-shingle roofs are particularly fire-prone, thus current code prohibits the use of untreated wood shingles or shakes for new or replacement roofing. Wood-shingle roofs are prevalent in residential areas of Riverside County.

As can be seen in Table 4-1, disastrous wildland fires start in many ways. The most common cause of urban and wildland fires is man. However, the effectiveness of current fire safety

efforts, and the extent of loss during fire disasters, can be readily evaluated using an earthquake scenario. Thus, this chapter provides loss estimation scenarios for major earthquake-induced fires, with and without Santa Ana winds.

Using an earthquake to model worst-case fire scenario hazards may also help us to remember a key point. Fire prevention and suppression are not the only services provided by fire departments. Other obligations, like search and rescue, can reduce fire suppression resources after a catastrophe, and this must be factored into emergency preparedness planning.

4.1.1 Previous Fire Disasters

Unfortunately, damaging fires are a fact of life throughout California. In 1994 alone, more than 525,000 acres were destroyed in California wildland fires, making it one of many billion dollar pay-out years for insurers. In 1995, the California Department of Forestry and Fire Prevention (CDF) battled 6,621 blazes that damaged or destroyed 121 structures. To date, the most destructive fire in California history was the fast-moving 1991 Oakland Hills fire, called the "Tunnel" fire (Table 4-1).

Table 4-1 lists the twenty largest California wildland fires, their locations, causes and extent of devastation. They are ranked according to number of structures lost. Note the great variation in acres burned. Many of the older fires on this list would be far more devastating today, as area populations have grown.

In Riverside County, the most severe fire disaster to date occurred in October 1993, Powerlines knocked down by Santa Ana winds started a fire that destroyed 107 homes and burned 25,100 acres in Riverside County (Table 4-1 and 4-2). Gubernatorial Proclamations of a State of Emergency and Presidential Major Disaster Declarations (Office of Emergency Services, 2000) affecting Riverside County have been declared on that and five other occasions in the last 30 years (Table 4-2). Historical fires and their locations within the County are illustrated on Figure 4-1.