Wildfire

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Shortly after the end of the field surveys for this atlas in 2002, San Diego County was swept by fires of a scope unprecedented in recorded history. In February 2002 the Gavilan fire burned 9.0 square miles north of Fallbrook. In July and August 2002 the Pines fire burned 51.4 square miles along the east slope of the mountains from Hot Springs Mountain almost to Mount Laguna—making it the second-largest fire in San Diego County history, behind only the Laguna fire of 1970. Then in October 2003, during ferocious Santa Ana winds, the Roblar fire burned 7.6 square miles in Camp Pendleton, the Paradise Fire burned 88.1 square miles in northern San Diego County east of Valley Center and Escondido, the Otay fire burned 69.9 square miles between Otay Mountain and Jamul, and the Cedar fire, the largest single fire in California history, burned 436.4 square miles of central San Diego County from Miramar and Crest east to Julian and Mount Laguna. The conflagrations killed 17 people, compelled the evacuation of thousands, burned 2454 houses, and shut the business of the city of San Diego down for two days. From a human perspective, the firestorm was the most pervasive disaster in San Diego County history. Was its effects on birds and other components of the natural environment just as great? Only time—and adequate study—will tell. Nevertheless, ecological succession following smaller fires suggests that long-lasting effects are likely only among the most localized and specialized species.

Southern California's ecology implies a long history of evolving with fire. Few places in San Diego County remain unburned through recorded history (Figure 11). After a fire, the native vegetation grows back quickly. For many plant species, fire is required to break their seeds' dormancy and allow germination. Most annual plants respond vigorously to fire, and the increased minerals and nutrients in the ash often allow them to grow to extra-large sizes. There are dozens of wildflowers that are "fire-followers," especially in the poppy and waterleaf families. Shrubs and trees may grow back from seed after fire. Many woody species also have the ability to resprout from stems or burls. In most cases, vegetative cover is

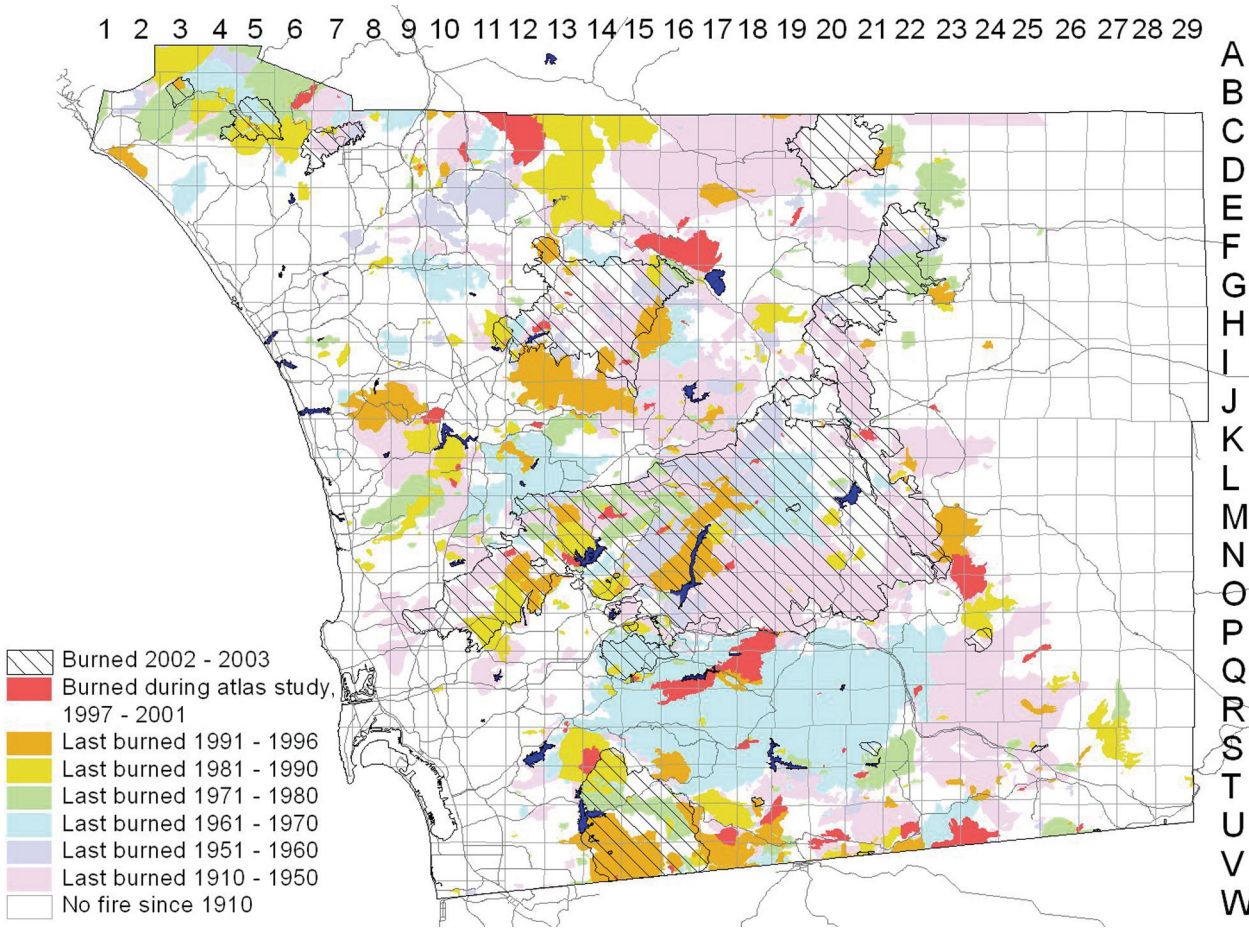

Figure 11. San Diego County fire history, 1910–2003, based on data maintained by the U.S. Forest Service's Remote Sensing Lab.

fully re-established after three to five years (no additional erosion expected). Within 10 to 15 years the vegetation structure is similar to, though usually less dense than, the structure before the fire. Chaparral usually will not burn again until it is 25 to 30 years old. Coastal sage scrub, however, may reburn after only a few years, before shrubs have become large enough to survive another fire. This is a major concern, as too-frequent fire can rapidly convert coastal sage scrub to non-native grassland, particularly at drier inland sites. Such a conversion can be seen over large areas of the San Jacinto basin in western Riverside County. Next to development, fire is likely to emerge as the greatest threat to coastal sage scrub.

Adaptations for recovery after fire are not limited to chaparral plants. Even species that may burn less often, such as riparian trees, are able to recover from fires. Coast live oak trees have very thick bark and are extremely resilient. Even trees that have been severely burned are usually able to resprout from their crowns. Other oak species that grow as trees (black oak, canyon live oak, Engelmann oak) may be "top-killed" by fire but resprout from the base. Sycamore, willow, and cottonwood trees resprout vigorously from their roots.

What about the animals? Hawks, ravens, and vultures congregate to feed on animals that were burned in the fire. In a fast-moving fire, rabbits, woodrats, and other animals may become confused and run into the flames. Birds too may be killed or injured. Fires may reduce animal populations substantially for one to several years, depending on the species' reproductive rate. In the first few years after the fire, the abundant flowers, new growth, and resprouts are highly nutritious and very attractive to Costa's Hummingbirds, deer, and quail. The effect on Costa's Hummingbird is especially dramatic because some of the plants that proliferate after fires, like the sticky nama or poodle-dog bush (*Turricula parryi*), showy penstemon (*Penstemon spectabilis*), and woolly blue-curls (*Trichostema lanatum*) attract feeding and nesting Costa's Hummingbirds in numbers far higher than in mature chaparral. Recently burned areas may be favored by birds that prefer sparser vegetation, such as the Sage Sparrow and Rufous-crowned Sparrow. The seeds of fire-following fiddleneck (*Amsinckia intermedia*) and popcornflower (*Cryptantha* sp.) plants are a major food for Lawrence's Goldfinch. Often Lazuli Buntings colonize recovering chaparral in large numbers. Although bird densities in burned areas are typically higher than those in older chaparral, nesting success may be lower, as nests are more easily detected by predators.

In spite of these adaptations by plants and animals, the fires may have a long-lasting effect if they are a symptom of a shift to a warmer, drier climate. Cool, moist habitats like coniferous forests are likely to show the results first. With the burning of the entire Cuyamaca Mountains in October 2003, some species could see their ranges cut back permanently. With southern California's latest drought—the most severe in recorded history—further large-scale wildfires seem almost inevitable.