

RESTORING SOUTHERN CALIFORNIA BRUSHLANDS

Southern California brushlands consist of chaparral, coastal sage scrub, and desert scrub. By far, this “impenetrable thicket,” as one traveler called chaparral in 1860, covers the most area. Chaparral grows on dry ridges above the coastal woodlands, although the less dense coastal sage scrub replaces it near the coast. Frequent Indian fires on the lowlands kept sage scrub from spreading down slope. Therefore, historically grasslands usually occupied the terrace-like bluffs overlooking the ocean where coastal sage now grows.

Brushlands like chaparral and coastal sage in California, burn in crown fires. These hot fires often swept over thousands of acres. They were stand-replacing fires that renewed the brush on about a 40-year cycle. Even so, they were much smaller than today’s brush fires. They usually burned patches of a few hundred or thousand acres, sometimes larger, but seldom, if ever, hundreds of thousands of acres as we see today.

Chaparral may have looked like a continuous covering of thick shrubs, but it consisted of a mosaic, each part in a different stage of recovery from the last Indian or lightning fire. J. B. Leiberg described it in 1900 as, “A growth which varies from extremely dense to thin or open, but rarely forms large uninterrupted patches.” The patches of younger shrubs in the mosaic acted as fuel breaks that blocked the movement of fires that burned in the more flammable older shrubs. This helped to perpetuate the mosaic and reduced the size of fires.

The variety of patches in historic brushlands helped to contain hot fires just as they did in forests. Freshly burned areas and patches of young shrubs didn’t burn well and served as fuel breaks. Patches of five-year old or younger chaparral will not carry a fire. Patches less than 20 years old will not carry a fire except under extreme conditions, such as Santa Ana Winds. Even then, they often don’t carry fire. These less flammable patches were scattered over the landscape and isolated flammable older patches of chaparral. Therefore, hot fires couldn’t spread over vast areas. In short, nature developed an ingenious pattern of natural fuel breaks that kept most historic brushlands immune from mega fires.

Some people believe that horrific brushland fires are wind-driven events. They are wrong. Science and nearly a century of professional experience shows that they are fuel driven events. Wind contributes to the intensity of a fire, but no fire can burn without fuel, no matter how strong the wind. Wind, topography, and drought play an important role in fire behavior, but continuous heavy fuel is the fundamental cause for the outbreak of catastrophic fires plaguing the West, especially in California.

The most recent example is the 2006 Sierra Fire in Orange County California. This fire stayed mainly in 38-year old brush even though Santa Anna winds gusting to 64 mph were pushing it. Not surprisingly, the fire stopped when it hit an area covered by 4-year old brush on the North and 9-year old brush on the South.

In addition, San Diego County's Agriculture Department created maps that show that the October fires of 2003 were concentrated in older brushlands. As expected, firefighters also found it easier to stop the fires at the boundaries of younger less flammable patches of chaparral, even in Santa Anna winds.

Dr. Richard Minnich, from U.C. Riverside, demonstrated this conclusively when he compared the size of fires in Southern California with Baja California. The difference is striking because of the linear border that separates both countries. This is a political border, so climate, winds, vegetation, and fires are directly comparable.

On the Mexican side, patches are very small, a few hundred or thousand acres, because fires burn often as they did when Native Americans lived there. Today, farmers set fires regularly to maintain the mosaic of small patches that provide habitat for game and livestock. This keeps fires small and safe. They also let lightning fires burn because less flammable young patches easily contain fires that burn in older more flammable patches.

In contrast, we have been putting out fires for over a century in Southern California. Even longer if one considers the proclamation by Don Jose Joaquin de Arrillaga, Captain of Cavalry, Interim Governor and Inspector Comandante of Upper and Lower California, in 1793. He said, "With attention to the widespread damage which results ... I see myself required to have the foresight to prohibit ... all kinds of burning, not only in the vicinity of the towns, but even at the most remote distances...."

It only takes 30-40 years for chaparral to grow old enough to create large areas of highly flammable fuel. Even though ranchers increased burning when California became a state, Governor Arrillaga's proclamation helped start the cycle of mega fires long before some people believe that fire control became effective. Now, after more than two centuries of effort to control fires in Southern California, it is not surprising that our fires are so much bigger and more destructive than those in Mexico.

If you want to know where the next firestorm will likely occur in Southern California brushlands just look at the age of the chaparral. The older the chaparral the greater is the danger of a catastrophic wildfire.

One of the most threatened areas is where San Diego County's Laguna Fire burned in 1970. In 24 hours, the fire burned westward from near Mount Laguna into the outskirts of El Cajon and Spring Valley, and devastated the communities of Harbison Canyon and Crest. When it was over, the fire had scorched 175,425 acres, destroyed 382 homes, and killed 8 people. The brush that burned in the Laguna Fire is now 36 years old and ready to burn again. Even more disturbing, thousands of acres of brush that is 50 years old and even more flammable surrounds the area on three sides. That means the next fire could be nearly twice as large.

Interestingly, the Governor's Blue Ribbon Fire Commission report following Southern California's 2003 wildfires recommended "a safer mix" of age classes "in chaparral" and "fuel types" in forests. Nothing would be more effective for preventing future firestorms

and saving lives, property, and forests. The 1994 and 1995 reports sponsored by the Watershed Fire Council of Southern California and the University of California Cooperative Extension mentioned earlier made the same recommendations. Unfortunately, the Forest Service and other agencies still haven't implemented them.

We can prevent large brushland fires and improve the diversity of plants and animals with restoration forestry. This is easily done by breaking up old highly flammable brush, which means 30 years or older, into small patches and surrounding them with younger less flammable brush, thereby creating a mosaic of different age classes of shrubs. Prescribed fire and mastication are the main tools available to do it until we find an economic value for chaparral, such as biomass energy.

Four-Zone Strategy

I propose a four-zone strategy to prevent the next firestorm in brushlands. This strategy assumes adequate firefighting resources are available.

Zone 1: Defensible space around homes. This is essential in all high fire hazard areas.

Zone 2: Fuel breaks around communities. The most effective fuel breaks are at least ¼ mile wide. In brushlands, they should include scattered islands of brush for wildlife.

Zone 3: Fuels management beyond fuel breaks. This zone should extend at least 2 miles beyond fuel breaks. It provides adequate protection against firebrands that can fly ahead of a wildfire and set new fires.

The fuels management zone should consist of a mosaic of small patches of brush in which 50 percent of the patches are less than 20-years old and no more than 50 percent of the patches are 20 to 40-years old.

Zone 4: Natural fire management beyond the fuels management zone. This zone provides a low cost solution to fire prevention as long as defensible space, fuel breaks, and the fuel management zone are adequate to protect communities.

In this zone, fires should be "herded" before Santa Ana winds begin blowing. All fires should be suppressed immediately after Santa Ana winds begin. This approach should restore the historic fire resistant brushland mosaic within about 50 years.

This four-zone strategy for protecting communities and restoring brushlands, together with modern and effective firefighting organizations, will break the cycle of mega fires that destroy lives and property while also improving the health and diversity of our brushlands.

