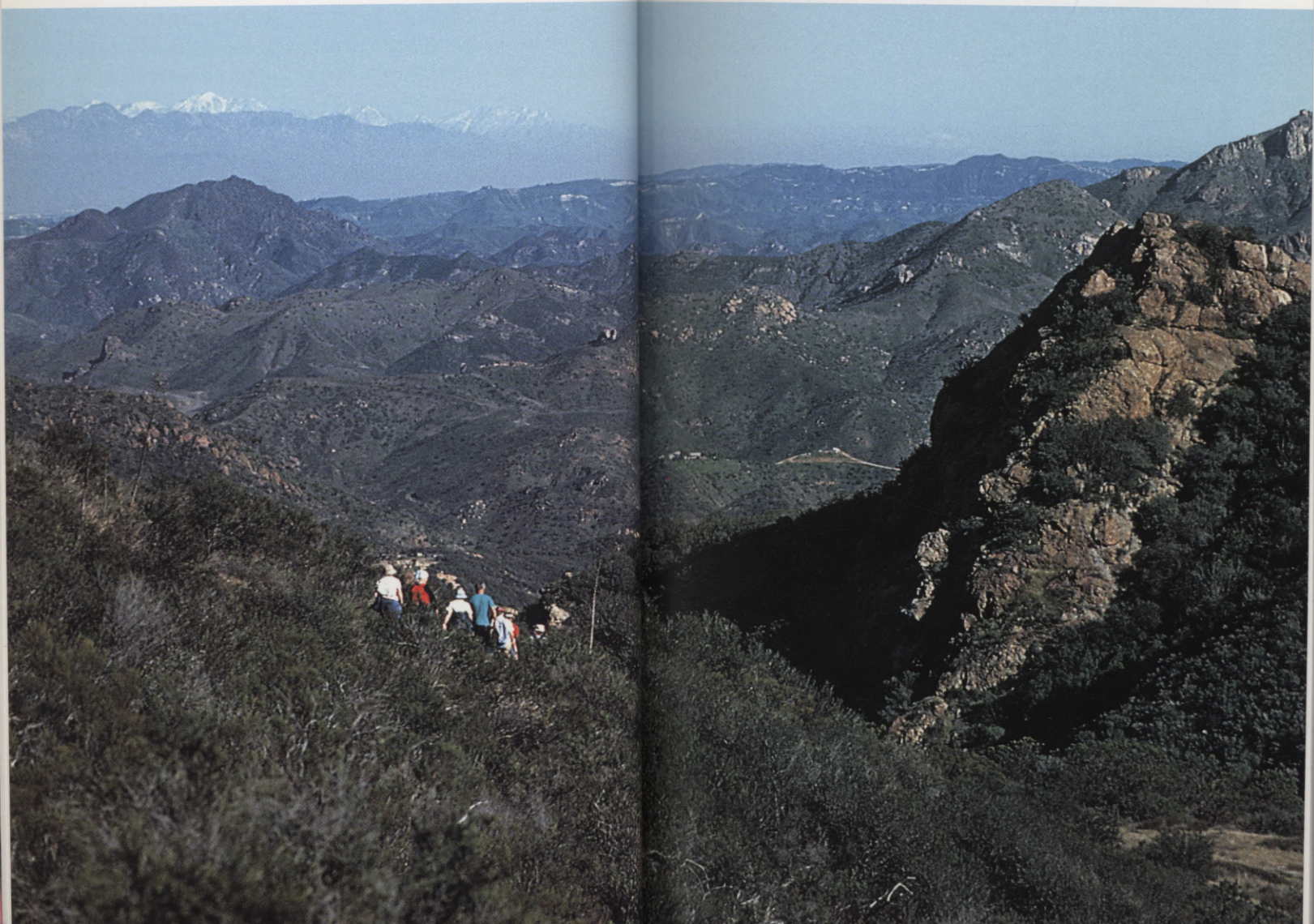


CHAPTER 1
THE CALIFORNIA CHAPARRAL



CHAPARRAL IS BOTH a vegetation type and the name given to the community of coadapted plants and animals found in the foothills and mountains throughout California. The chaparral vegetation is composed of a diverse assemblage of different species of evergreen drought- and fire-hardy shrubs. Seen from the car window or scenic lookout, chaparral looks like a soft bluish green blanket gently covering the hills. Up close, however, this “blanket” no longer appears soft. Instead, what is revealed is a nearly impenetrable thicket of shrubs with intertwined branches and twigs with hard leaves and stiff and unyielding stems. The shrubs are well adapted to the rigors of long, hot, dry summers and unpredictable winter rainfall that are characteristic of California’s mediterranean climate. Chaparral is especially extensive in the central and southern parts of the state, but it covers large areas of northern California as well (pl. 1).

A stand of mature chaparral (10 years old or more) is usually composed of shrubs of the same age and approximate



Plate 1. Mountain chaparral (*foreground*) is typically found adjacent to pine and oak forests, as seen in the distance (Mendocino County).



Plate 2. This view into the understory of a stand of hoaryleaf ceanothus in the San Gabriel Mountains shows the dense growth of shrub stems and the absence of an understory beneath mature chaparral. The metal objects in the foreground are seed traps.

height, dating from the last fire. The canopy height can range from waist level to 20 feet tall. While the shrubs may be quite tall, the leaves are found only in the upper portions where strong sunlight reaches. Below the leafy canopy the shrubs have one to several rigid, woody stems that arise from a common base (pl. 2). These stems range in size from one to three inches in diameter in young stands and up to 12 inches thick in older stands. Mature shrubs grow so close together that the branches of adjacent plants are interlaced, forming an unbroken layer of vegetation with few openings. Beneath the shrubs the dimly lit ground lacks any vegetation and is bare except

for a sparse litter of dead leaves and twigs. In many species of chaparral shrub there is a burl or root crown, an enlarged woody mass at or slightly below the soil surface at the base of the stems. After fire, if the above-ground portion of the plant has been killed, the burl produces new shoots fed from a deep root system. The roots may travel 100 feet or more in search of water. Growing both horizontally and vertically, the root systems of chaparral shrubs form a matrix that holds the soil in place on the hillsides (fig. 1). Despite the underlying hard nature of the stems and leaves, the shrubs produce beautiful and fragrant blossoms, such as those of bigpod ceanothus (pl. 3).

Mature chaparral stands may persist for a century or more, the shrubs changing slowly over time. With the passage of time most shed branches and leaves, while others die completely.

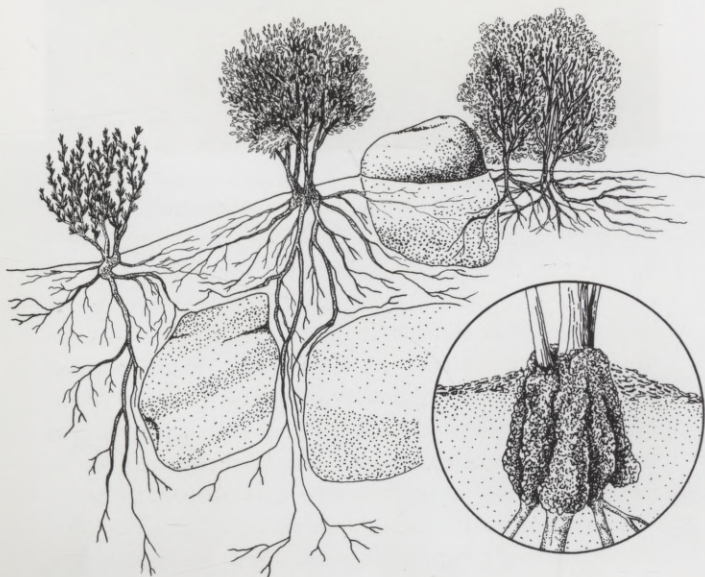


Figure 1. Root systems of the three most common types of chaparral plants: chamise (*left*), manzanita (*middle*), and ceanothus (*right*) help hold the soil. The inset shows a typical young chamise burl.



Plate 3. Bigpod ceanothus in flower, with immature fruits in the center. This species is common in southern California.

The overhead branches are quite dense in mature chaparral, but with age there is often a space beneath the shrubs that is tall enough for exploration on hands and knees. Sitting quietly beneath these shrubs, away from the sunlit hubbub above, a patient observer can take advantage of the unobstructed view near the ground to see some of the unique animal inhabitants of dense chaparral. For example, common sights are thrashers rummaging through the litter with their long curved bills, and California Whipsnakes, also known as Striped Racers, hurrying about with head held high (see chapter 5). In these natural surroundings many animals do not seem to recognize humans as dangerous and go about their business as if no one were present. Birds like the curious Wrentit will hop from branch to branch until they are almost within reach, with head cocked from side to side so that each yellow eye in turn can look closely at the strange and clumsy visitor.

The name chaparral, from *chaparro*, was given by Spanish



Plate 4. Toyon, or California holly, with fruit clusters. This is the plant that gave Hollywood its name.

colonists to refer to the place where scrub oaks grow. The California chaparral reminded them of the similar-appearing vegetation of southern Spain (see chapter 2 for more on other mediterranean climate areas). “Chaps,” leather leggings worn by riders on horseback to protect against scratches from thorny vegetation, is a word that derives from the same Spanish root word.

Chaparral is built into the visual image of outdoor California even for those who have never visited the state. It forms the backdrop for thousands of movies, television productions, and videos because it is the common vegetation of the hills and mountains around Los Angeles. One chaparral plant, California holly, is, in fact, responsible for giving Hollywood its name (pl. 4). Everyone who sees filmed car chases on mountain roads, advertisements for SUVs taking on the tough hills, or the televised mountain vistas above the Rose Bowl on New Year’s Day has seen chaparral.

Chaparral is a place full of life. It is an ancient and exqui-

sitely balanced community of many kinds of plants and animals, each with its own special stories. For example, it has rain beetles that stay hidden underground for years, outlasting drought (pl. 5), fire beetles that mate only on burning branches, plant seeds that require fire to germinate, lizards that shoot blood from their eyes when threatened, kangaroo rats that never drink water, and wood rats that collect seeds, forks, tire treads, and a host of other strange objects to build up their nests. We include these and other stories throughout the book.



Plate 5. A male rain beetle preparing to fly in search of a mate.

Fire and Chaparral

Chaparral has always existed with fire. It is this natural “disaster” that often brings chaparral to public attention, but it is a normal and natural part of life in the chaparral. A cycle of recovery and new birth is initiated by the burning off of the shrubs that make up the mature chaparral. The seeds produced by many chaparral shrubs require fire to germinate. Specialized short-lived plants, called fire annuals, appear only in response to fire even if they have to wait more than 100

years between blooms! Similarly, deer, birds, lizards, and insects use the lush new growth that appears after fire for food and reproduction. Fires do not touch all chaparral areas in a single year, and some areas may be missed by fire for a century or more. This does mean that very large fires as well as many smaller ones may happen apparently randomly in different parts of the state. The irregularity of fires is natural as well. Fire frequency depends on the condition of the vegetation and the interaction of factors such as ignition source, winds, season, topography, and time elapsed since the previous fire. This unpredictability creates a patchwork of recently burned and long-unburned chaparral across the state.

Plate 6. Mariposa lilies come in many colors: pink, white, orange, red, or yellow as shown here. Many have patterns of stripes, dots, and hairs to aid in pollination (Santa Monica Mountains).



Shrubs surrender the ground to lower and softer plants for a brief period after fire. At this time some of the most beautiful wildflowers in the state appear in great numbers, forming a brilliant and colorful carpet quite different from the tangle of shrubs that preceded them. California is known for its poppies, but in addition to these, after a chaparral fire there are also whispering bells, lilies (pl. 6), snapdragons, phacelias, and dozens of species of small flowering plants found at no other time or place. Chaparral recovers quickly after fire,

spreading a fresh mantle of shrubs upon the hillsides within a few years. The chaparral has existed for many thousands of years in California, and fire has always been an integral part of this community. In short, no fire, no chaparral.

Life in chaparral is unpredictable. It is a place that is fierce and unrelenting, fabulously beautiful, and prone to disaster and yet has persisted for countless millennia. The juxtaposition of the natural processes of the chaparral ecosystem with growing urban areas produces difficulties on both sides. Many of us live in intimate association with chaparral, for better or worse, so it is important that we come to understand it.

The modern era of urban-wildland chaparral fire holocausts, so prominent in news stories each fall, opened with the Bel Air fire of November 1961 when Santa Ana winds drove a fire out of the chaparral of the Hollywood Hills into an enclave populated by the rich and the famous. In a few hours almost 500 of some of the most expensive houses in the state were gone. Aldous Huxley lost a lifetime collection of books and papers that might have become the pride of a research library. After that event he called himself "a man without a past." One celebrity is reputed to have remarked, "Things like this shouldn't happen in such a nice neighborhood." Indeed, they should not. But despite this sentiment, things like this do happen in all kinds of neighborhoods and will continue to do so as long as we persist in building flammable houses in fire-prone settings, such as chaparral-covered hillsides and canyons (pls. 7, 75, 78). A house perched on a ridge atop a chaparral-filled canyon is almost sure to be threatened by fire at some point, especially if it has large wooden decks, overhanging eaves, and a wooden roof. While many communities now make fire-resistant roofing a requirement and others insist on low-flammability vegetation surrounding a house, the overall effect is imperfect. The natural functioning of the chaparral includes the potential for catastrophic mudslides, as well as fire. Mudslides may result from the combination of heavy rains and steep hillsides recently denuded of chaparral by fire.



Plate 7. Chaparral wildfires can spread over large areas, as seen in this photograph from the Malibu fire in 1985.

We like to build our communities where we want, despite clear indications of danger from fire and subsequent mudslides. This is costly for all concerned (see chapter 6 for further explanation). Fire is an intrinsic part of the chaparral, as it has been for many thousands of years, and it is up to us individually and collectively to take responsible action recognizing this inevitability.

Where Is Chaparral Found?

Chaparral is never far from sight in much of California. The tourist at San Diego's animal parks looking to the east, the Los Angeles commuter idly gazing to the north, a school child in the Great Valley watching the eastern horizon for airplanes, and the Bay Area resident on the way to Tahoe and scanning the Sierra for signs of snow will all see hillsides covered with

chaparral. Chaparral provides the shrubby covering of the foothills ringing the populated valleys and coastal plains of the state. Many suburban dwellers now live surrounded by chaparral.

Chaparral covers approximately 7 million acres of California. It is found on coastal and inland mountain slopes throughout the state west of the deserts, north into southwestern Oregon, and south into Baja California (map 1).

Chaparral is most extensive and diverse from the Central Coast Ranges south and inland to the interior edges of the South Coast, Transverse, and Peninsular Ranges, and south of the international border to the southern end of the Sierra San Pedro Martir (map 1). Chaparral is found along coastal bluffs and mountains, around the fringes of valleys, up foothills, and across entire mountain ranges. Vast and continuous tracts of chaparral cover most of the interior of the counties of Monterey, San Luis Obispo, Santa Barbara, Ventura, Orange, and San Diego. In these places chaparral is often the dominant vegetation as far as the eye can see (pl. 8). In northern California, chaparral blankets the hillsides of the San Francisco Peninsula and grows thickly in Lake and Mendocino Counties and inland farther north. At points it may descend to the coast, and chaparral intergrades with forests as it moves north. Chaparral also covers much of the Sierran foothills, as can be clearly seen on the drive from the west into Yosemite National Park.

Chaparral Is Found with Other Vegetation Types

California's landscape is heterogeneous, and as a result many different local environmental conditions exist side by side. This gives rise to much variation in plant and animal distributions over short distances. Latitude and elevation repro-



Map 1. Major topographical features and the general distribution of chaparral in California. The shaded areas indicate chaparral. These areas exaggerate the total area occupied by chaparral because in some places they include associated plant communities such as oak and pine woodlands, and coastal sage scrub.



Plate 8. Parks throughout the state, like this one in the Santa Monica Mountains in southern California, offer hiking and other recreational activities in chaparral.

duce many of the same temperature and rainfall gradients; for example, a high mountain in southern California may be as moist and cool as a low-elevation area farther north. Local topographic and soil factors also affect the environment. Sometimes this means that vegetation types such as chaparral (pls. 9, 10) will be juxtaposed or intermingle with elements of pine or oak forests or border grasslands, or mingle with desert or coastal species.

Because of this physical heterogeneity, chaparral, which is widespread, does vary in composition from place to place. The plant species present in each area are those best suited to the particular local climatic conditions, soils, and topography, and their distributions are independent of those of other species. Chaparral shrubs may be found as occasional members of other communities as well. The boundaries between chaparral and other communities may be distinct, as where pro-



Plate 9. Flowering chaparral yuccas, a common sight in chaparral, particularly after fire. Scarlet bugler and a white-flowered ceanothus shrub appear in the foreground (Lone Pine Canyon, San Gabriel Mountains, May 1971).

Plate 10. Geological movements have produced rocky exposures and mixed soil types on which chaparral grows, along with trees and grasses. Oaks forest covers the north-facing slope of the mountain (left of the rocky ridge) and dots the lower slopes, while grasses make up the light green areas and chaparral forms the solid medium green cover over most of the hillside (Mount Diablo, Contra Costa County).



chaparral are useful at the local level to land managers and others in the community who deal with particular areas on a day-to-day basis. At least 48 such chaparral classifications have been proposed and are used by state agencies and conservation organizations (see *A Manual of California Vegetation*, in the supplemental readings section).

Coastal Sage Scrub Is Not Chaparral

Coastal sage scrub is a low-growing drought-deciduous shrubby vegetation type found in the southern half of California. It is sometimes confused with chaparral and can grow near it, but it is a distinct vegetation type in its own right. Probably the most characteristic aspect of coastal sage vegetation is its smell, a pungent, spicy aroma that carries for great distances. Although both vegetation types are shrubby, a notable difference between chaparral and coastal sage is that while chaparral plants are evergreen, coastal sage plants are drought-deciduous, losing their leaves during the hot part of the year. Coastal sage shrubs are also typically shorter (three to six feet tall), with pale, soft leaves and stems, and there are gaps between shrubs. The foliage is pale in color due to a covering of white or gray hairs on one or both sides of the leaves. The dominant shrubs of this vegetation type are the sages, buckwheats, and California sagebrush. Coastal sage plants can exist in drier areas than can the evergreen chaparral shrubs and so are also found on dry hilltops, ridges, and outcrops in chaparral communities in southern California. They are also characteristic of disturbed areas along roadsides, sometimes far inland. Because plants have individual preferences and tolerances, occasionally a chaparral shrub such as lemonadeberry or laurel sumac will be found in areas dominated by coastal sage and vice versa.