A Sportsman's Guide to Improving Deer Habitat in California

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Spring staging area for the Buttermilk Deer Herd, eastern Sierra Nevada.
photo by Tom Kucera

Preface

Several years ago, a sportsman interested in improving deer habitat asked our help on a project to widely plant a species of shrub that mule deer are known to favor. While appreciating his energy and desire to improve deer habitat, we knew that the particular shrub he wanted to plant was not native to the project area. Because the species occurred in a region ecologically very different than the proposed project area, we predicted that it would probably do poorly if it survived at all. Thus, we were concerned that the project would be waste of time, money, and people's energy, regardless of the admirable motivations of the sportsmen. When we relayed our concerns to him and suggested different, more ecologically adapted plants, and specific habitat manipulations known to improve the value of habitat for deer, he challenged us to provide this biological and management information in a more complete and readily available format. His concern was that without this type of information it was hard for the sportsmen to know if they were doing the "right thing". While this interaction helped point him in the right direction, it also planted the conceptual seed for this Guide. Therefore, we sincerely hope that this seed grows into better deer habitat conditions throughout California.

I. Introduction

Millions of people in California value mule deer for recreational, ecological, or esthetic reasons. Many of these deer "aficionados" are concerned about the quality of deer habitat and would like to do something to improve it. The purpose of this document is to suggest ways that people interested in improving mule deer habitat can do just that. Whether or not you are a landowner, you have the ability to affect the quality of deer habitat.

In this document we:

1) Introduce the different subspecies of mule deer that live in California and briefly discuss where they occur and how they differ;

2) Describe the eight bioregions most important for mule deer in California, and components of deer habitat within them;

3) Identify which resource-management agencies or landowners have the most influence on deer habitats, describe the planning process that federal agencies follow to make decisions on management activities that affect

deer habitat, and suggest ways that people can get involved and make a difference;

4) Describe various types of habitat improvements often made for deer; and

5) Describe mule deer habitats and ecology by bioregion and suggest hands-on projects that may be appropriate for interested groups such as sportsmen's clubs.

We anticipate that upon becoming familiar with the contents of this Guide, the reader will be more familiar with the habitats and management of deer in California's various bioregions. You will better understand who the "players" are in the management of deer habitats and what types of land-management activities are conducted that affect deer habitat. You will learn how to become involved in the decisions regarding management on public lands that affect deer habitat, and the types of management or specific habitat-improvement projects that benefit deer.

At the outset, we also want to emphasize that improving habitat for deer also will benefit a variety of other wildlife species, from songbirds to small mammals to larger carnivores. We hope that this Guide will provide tools for motivated people to improve the quality of deer habitat, and increase the broader wildlife "richness" in California.

California mule deer in Yosemite Valley.
Photo by Hap Ritter

II. Mule Deer in California

The deer family, or *Cervidae*, has some 40 species worldwide. (A species consists of naturally occurring groups of individuals that share an evolutionary history, interbreed and that typically do not interbreed with other species.) All species of the *Cervidae*, or cervids, share certain characteristics, such as a vegetarian diet that is broken down by bacteria and protozoa for digestion in a complex stomach called a rumen, or paunch. The unique characteristic of members of the deer family, present in no other animals, is their ability to grow and shed antlers yearly.

Mule deer are one of five native species of cervids that occur north of Mexico; the others are the closely related white-tailed deer (for a complete list of species scientific names see Appendix IV on page 93), the caribou, moose, and elk. Only elk and mule deer occur naturally in California. Several species of exotic deer from Europe and Asia, such as the fallow and axis deer, were introduced to California and now occur in certain areas, perhaps most notably the Point Reyes Peninsula in western Marin County. However, the mule deer is by far the most numerous and widely distributed deer in California.

The mule deer's scientific name, *Odocoileus hemionus*, translates loosely from the Latin as "hollow-tooth half-ass". This refers to a characteristic of their dentition and to their large, ass-like ears, from which we get their common name. Mule deer occur throughout western North America, from southern Alaska to central Mexico. Different wildlife specialists have identified between seven and eleven subspecies of mule deer. (A subspecies is a form that is somewhat distinct in appearance and geographically separated from other subspecies. Subspecies can readily interbreed when brought into contact, and often intergrade when they occur adjacent to each other.) The subspecies of mule deer are distinguished largely on the basis of coat color and markings, especially the size of the light-colored rump patch and the amount of black on the tail, as well as body size. Other characteristics, such as the length of the metatarsal gland on the outside of the lower leg, also vary among the subspecies. The California Department of Fish and Game (CDFG) lists six subspecies of mule deer as occurring in California (Figures 1 and 2).

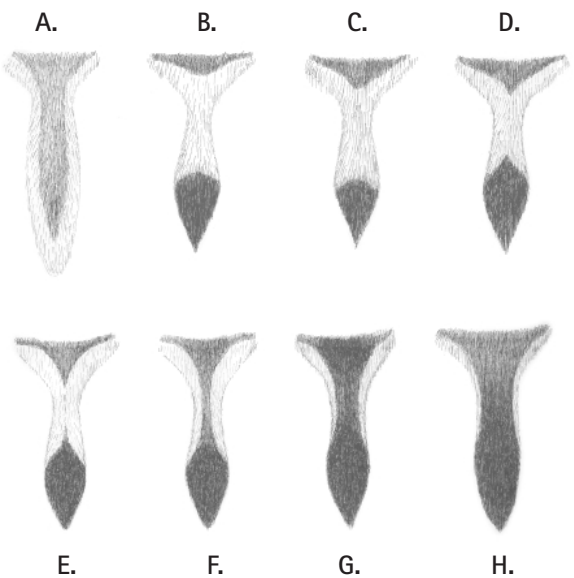

Figure 1. *Illustrations of typical deer tail patterns: A.) White-tailed deer (for comparison), B.) Rocky Mountain mule deer, C.) burro mule deer, D.) Inyo mule deer, E.) California mule deer, (F.) California mule deer (alternate), G.) Southern mule deer, and H.) Columbian black-tailed deer.*

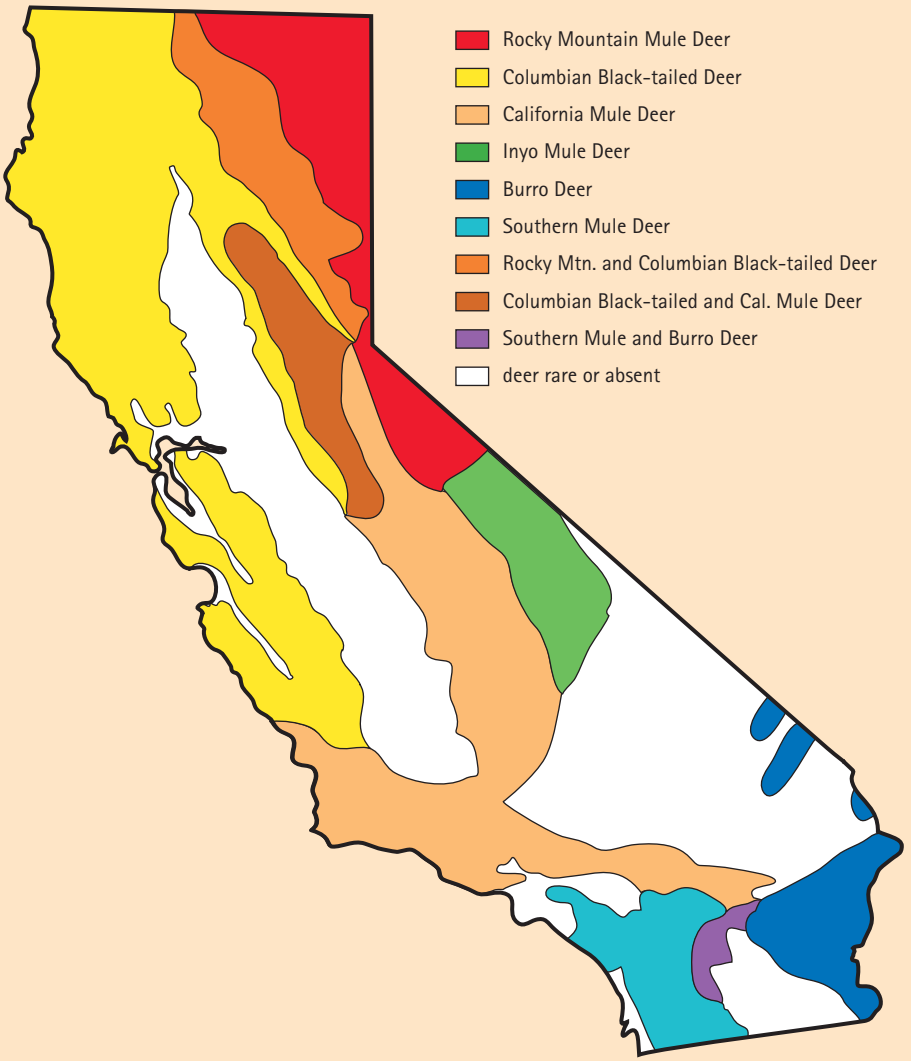

Figure 2. Deer Distribution in California

Source: California Department of Fish and Game

A. Subspecies of mule deer in California

1. The **Rocky Mountain mule deer** is the most widespread subspecies of mule deer, and occurs as far east as Nebraska and as far north as Canada. It was this subspecies that was first seen and described along the Missouri River in 1804 by Merriwether Lewis, who referred to it as a mule deer because of its mule-like ears and tail. In California, it is found mainly east but also west of the crest of the Sierra Nevada and Cascade Range, from the Oregon border to Mono County.

   Most Rocky Mountain mule deer are seasonal migrants. They spend winters on Great Basin Desert shrublands feeding primarily on sagebrush and bitterbrush; many leave the state to winter in Oregon and Nevada. They spend summers at higher elevations in the mountains, often on the west slope of the Sierra Nevada and Cascades in pine and fir forests, and higher in subalpine and alpine zones. Their summer and winter ranges may be quite distant (sometimes 50 airline miles or more). Rocky Mountain mule deer are among the largest mule deer, and are distinguished by a relatively large, white rump patch and a tail that is black only at the tip.

2. The **Inyo mule deer** occurs only in California, ranging east of the Sierra Nevada in Mono and Inyo counties. Like the Rocky Mountain subspecies, it is migratory, with low-elevation Great Basin Desert winter ranges and higher-elevation summer ranges, often on the west slope of the Sierra Nevada. Although a bit smaller it closely resembles the Rocky Mountain mule deer. Most wildlife biologists believe the Inyo mule deer is simply a southern form of the Rocky Mountain mule deer.

3. The **Columbian black-tailed deer** occurs in much of northern California. It lives in coastal areas from the Oregon border to about Point Conception in Santa Barbara County, and occurs inland to the western slope of the Sierra Nevada and Cascade Range north of Lake Tahoe. South of the San Francisco Bay area, it occurs and hybridizes extensively with the California mule deer. As its name implies, Columbian black-tailed deer have entirely black tails; they also have a relatively small rump patch. The subspecies extends as far north as British Columbia. When Merriwether Lewis saw them along the lower Columbia River, he thought they were a separate

Rocky Mountain mule deer

Columbian black-tailed deer

These two deer illustrate the tail pattern differences between the subspecies.
Photo by Steve Guill

species, but this distinction did not hold among modern deer specialists.

The range of the Columbian black-tailed deer encompasses a variety of habitats, from the wet coastal forests of Del Norte County to coastal grasslands of Marin County to oak woodlands and woodland chaparral of Monterey County. Inland, they range seasonally from annual grasslands and pine forests through fir forests and higher. Some populations, such as in the western Sierra Nevada, are migratory, and spend winters at lower elevations and summers in the mountains where they may share summer range with Rocky Mountain mule deer. Other populations, especially near the coast, are resident; that is, individuals live year-round in an area of about 1 square mile or less.

4. The **California mule deer** occurs in coastal areas from south of the San Francisco Bay area, where it hybridizes with the Columbian black-tailed deer, south through the Tehachapi Range to the San Bernardino Mountains near Los Angeles. In the western Sierra Nevada, California mule deer occur from Lake Tahoe southward. The California mule deer has less black on the tail than does the Columbian black-tailed deer, and has a bigger rump patch; the tail often appears to have a black line down its length. There are both migratory and year-long resident populations of California mule deer.

5. The **southern mule deer** occurs south of the Los Angeles area in the coastal mountain ranges and continues into Baja California, Mexico. The black strip on the tail of this southernmost subspecies is considerably larger than that of the California mule deer, with which it is often confused. Southern mule deer are mostly resident, non- migratory animals; although some will move to lower elevations during periods of snow.
6. The **burro mule deer** is strictly a desert variety, found in the interior desert near the Colorado River. Specialists have discussed whether this is a valid subspecies or just a type of the more widespread desert mule deer that occurs in Arizona, New Mexico, and southwest Texas. Its habits are not well known, but extensive seasonal movements have been documented.

B. Bioregions of California

A major reason that California has so many different wildlife and subspecies of mule deer is the enormous physical and ecological diversity of the state. For example, in a day, one can easily travel from redwood forest to sagebrush plains, or from snowy mountain passes to cactus desert. California's size and diversity have provided many varied opportunities for mule deer to find suitable habitat. Following is a brief description of the eight bioregions recognized in California. These bioregions help us better understand relationships between deer and their habitats and thus design the most appropriate management strategies.

1. **North Coast/Klamath**. This bioregion extends from the Oregon border to San Francisco Bay. It extends inland to the montane forest of the Sierra Nevada and the Cascade Range and to Great Basin sagebrush steppe, and to the Sacramento Valley. The climate is humid temperate and marine near the coast; inland, summers are dry and the winters are rainy. Vegetation nearer the coast includes redwood forest, mixed evergreen forest with Douglas-fir and rhododendron, and mixed hardwood forest. Inland, vegetation includes Douglas-fir with chinquapin, red and white fir, and ponderosa pine, with subalpine conifer at higher elevations.

   Important deer habitats include riparian areas, shrub communities dominated by blue blossom ceanothus and deerbrush, and Oregon and black oaks with openings of annual and perennial grass.

2. **Cascade/Great Basin**. This bioregion includes the area east of the Klamath Province from the Oregon border south to Mt. Lassen and east to Nevada, including the Modoc Plateau. The summers are dry, and winters range from relatively mild and wet in the west to cold and harsh in the east. Sierran montane forest is most common at higher elevations, with mixtures of white fir, subalpine conifer, and ponderosa and eastside pine. To the east, sagebrush steppe and juniper savannah are most common.

   Important deer habitats include big sagebrush and bitterbrush, riparian and wet meadow complexes, and mountain mahogany.

Figure 3. Bioregions of California

Source: California Department of Fish and Game

Aspen habitat found in the North Sierra/Cascade and South Sierra Nevada bioregions. Aspen habitats are important to mule deer as foraging sites and areas where fawns are born and reared.

Photo by William F. Laudenslayer, Jr.

3. **North Sierra Nevada/Cascade**. This bioregion extends from Mt. Lassen to the south rim of the Lake Tahoe Basin. It is bounded on the west by the Sacramento Valley and on the east by the Great Basin. Its summers are dry and winters are cold and wet. Sierran montane forest predominates, with alpine communities at the higher elevations. On the west the vegetation mixes with the yellow pine forest and blue oak woodlands of the Sacramento Valley, and on the east with sagebrush steppe and eastside pine.

   Important deer habitats include high-elevation meadow and riparian areas with willows and stands of brush dominated by species such as mountain whitethorn, mid-elevation stands of black oaks, and low-elevation stands of blue oaks and buckbrush on the west side of the mountains and bitterbrush and sagebrush on the east side.

4. **South Sierra Nevada**. The South Sierra Nevada bioregion extends from the south rim of the Tahoe Basin and the South Fork of the American River to the Kern River drainage. The western boundary is the blue oak-foothill

Typical summer range habitat found in the South Sierra Nevada bioregion.

Photo by Tom Kucera

pine and chaparral of the San Joaquin Valley. On the east, the boundary is the Great Basin plant communities including sagebrush steppe and piny-on-juniper woodlands. Summers are dry and winters are cold. Sierran montane forests predominate, with ponderosa pine, white and red fir, sub-alpine conifers, and lodgepole pine forests and montane chaparral.

Important high-elevation deer habitats include meadows and willow-dominated riparian areas. Mid-elevation areas offer stands of brush such as mountain whitethorn and bitter cherry. At lower to mid-elevation, black oak and deer brush stands are key forage, and at low elevation, stands of buck brush and birch leaf mahogany on the west side of the mountains and sagebrush and bitterbrush on the east, are important for deer.

5. **Central Coast**. The Central Coast bioregion extends from San Francisco Bay south to the Santa Monica Mountains of western Los Angeles County. The western boundary is the Pacific Ocean; the eastern boundaries include the coast ranges and interior Joshua tree and creosote scrub in the south. Summers are dry and winters are rainy. Blue oak, chaparral, and annual

Oak woodland habitats of the Central Coast bioregion–Fort Hunter Liggett, California.
Photo by Paul Wertz

grassland are dominant vegetation types furnishing important deer habitats through the year.

6. **South Coast**. The South Coast bioregion extends south from the Santa Monica Mountains in Los Angeles County into Baja California, Mexico. It is characterized by dry, warm summers and rainy winters. Vegetation is largely coastal sage, oak woodlands, and chaparral; these, plus riparian areas and meadows, all provide deer habitat through the year.

7. **Inyo/Desert**. Between Lake Tahoe, the Mojave Desert, and east of the Sierra Nevada, this bioregion includes mountainous terrain and vegetation interspersed with arid valleys. Winters are cold and harsh, and summers are dry. Vegetation is strongly affected by elevation, ranging from creosote scrub, bitterbrush, and sagebrush at lower elevations through pinyon-juniper to subalpine conifers and alpine communities.

   Important deer habitats include high-elevation riparian and meadow areas and stands of mountain mahogany. Pinyon pines provide occasionally

Typical habitats of the eastern Sierra Nevada. Aspen, conifers, sagebrush, bitterbrush, and riparian areas (streams, seeps, and small meadows) offer diverse forage and cover areas for mule deer.

Photo by Tom Kucera

abundant pine-nut crops that deer like to eat. Bitterbrush and sagebrush are valuable low-elevation habitats.

8. **Southern Desert**. This bioregion, including both the Mojave and Colorado deserts, begins with the creosote and Joshua tree vegetation near the White-Inyo mountains in Inyo County. It continues through the Colorado Desert to the Mexican border. Climate is dry in all seasons, with hot summers and mild winters. Important deer habitats include desert washes, areas where strip-rains have produced annual vegetation and anywhere near water.