Columbian black-tailed deer often find dense conifer stands useful as escape cover in the North Coast/Klamath bioregion.

Photo by Tom Kucera

VI. Mule Deer in Bioregions of California

A. North Coast/Klamath

1. Deer Habitats and Ecology

Most deer in the North Coast/Klamath bioregion are migratory, spending winters at lower elevations and summers in high mountain areas. An important exception to this general pattern occurs among deer in areas near the Pacific coast, particularly in CDFG hunting zones A, B1, and B4, where most deer are year-round residents.

Summer ranges of the migratory deer are typically in conifer forests, where deer rely on important shrubs such as mountain whitethorn, deerbrush, snowberry or tobaccobrush, and buckbrush, along with various species of wild cherry. In the fall, oaks and the acorns they produce are very important for deer. Acorns provide an abundant source of nutrition during the period when much of the vegetation is dry and of low quality. Deer spend winters at lower elevations where herbaceous vegetation begins growing after fall rains. Filaree and clovers are important forages here. Also important for wintering deer, especially on the eastern side of this region, is chamise-dominated chaparral. The non-migratory deer are most abundant where there are openings, such as oak woodlands interspersed with grasslands and riparian areas, and less abundant in redwood and Douglas-fir stands.

2. Limiting or Important Habitat Factors

The shrubs upon which deer in the North Coast/Klamath bioregion rely, especially on the summer ranges, are disturbance-dependent. That is, they grow more abundantly and healthier where the land has been disturbed, such as with a fire. The downward trend in deer habitat in this region is related to the absence of disturbance, especially on summer ranges. With decades of successful fire suppression, the canopies of most of the coniferous forests have closed, allowing little light to reach the forest floor and preventing the growth of ground vegetation. Most of the shrubs that are present are older, mature plants. Young, early successional stages of shrubs, the kind that provide the best deer habitat, are rare. Thus, shrubs in the conifer-dominated summer ranges are mature and dying; in chaparral, with the suppression of fires, shrubs become overmature and decadent. Consequently, deer habitat suffers.

Also of concern in this bioregion is the condition of oak woodlands and riparian areas. The removal of hardwoods for firewood and other purposes and the lack of oak regeneration may have long-term negative consequences for deer habitats. Oaks provide forage, shade, and visual cover for deer and, perhaps most importantly, crops of highly favored acorns. Fire can be used to protect and enhance these hardwoods. Riparian habitats, those associated with streams, and wet meadows are degraded by heavy livestock use on both summer and winter ranges. This removes cover used, for example, to hide fawns, as well as succulent forage. Particularly along much of the coast and in

Degraded meadow riparian areas such as this reduces overall habitat quality for deer and other wildlife.
CDFG File Photo–Region 4

the southern portion of the region, many areas have been affected by heavy browsing by the deer population. Alder and willow are highly favored by deer, and are some of the only green forage left in late summer and early fall, the time of most nutritional stress in this bioregion. Heavy browsing by deer can remove them from a streamcourse.

Land ownership in this bioregion has important implications for deer habitat. Much land is privately owned here, both by large industrial timber companies and smaller ranching and timber operators.

3. Major Land Practices

The most dominant land management activity in the Klamath/North Coast bioregion is timber production; the second is livestock grazing. The most important landowners are the USFS and private (Figure 5 on page 30). Urbanization is a local problem on some winter ranges. The biggest effect of urbanization may be to reinforce the need for fire suppression in many areas, redirecting fire suppression to the rural-urban interface.

4. Habitat Improvement Practices

Several aspects of timber production can be modified to benefit deer habitat. Remember, what is needed is to produce early successional vegetation, namely shrubs and herbs, and then not hurry it along into later successional types such as closed-canopy forest with a poorly developed understory. Patch cuts, which open the tree canopy, will favor deer especially when the shrubs are not suppressed after the trees are removed. The practice of biomass thinning, in which small-diameter conifers are cut and chipped for burning in electrical-power generating plants, has the potential to open the canopy and favor growth of the understory; however, such benefits are yet to be documented in practice. Mechanical removal of vegetation does not provide the same factors, such as heat and mineral input, that fire does, and by stimulating tree growth, it may suppress the understory.

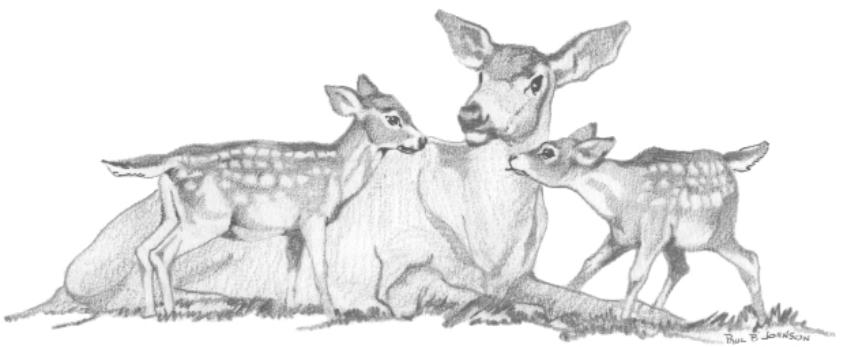
The dense forests that result from decades of fire suppression are subject to infrequent but catastrophic wildfires that may burn tens of thousands of acres. Post-fire management of these lands can have important consequences for deer habitats. These post-fire brushfields, some of the best deer habitat being produced, are unwanted by foresters because the shrubs suppress the growth of the conifer trees that are planted for later harvest. Suppression of brush to "release" the conifers, frequently with herbicides, is often practiced. Those interested in maintaining and improving deer habitat, especially on public lands, should demand management that allows shrubs to grow along with the conifers.

On chaparral and other shrublands, controlled burns are to be encouraged. Contact local CDF officials or CDFG personnel to find out how you can support plans to burn overmature shrublands.

Fencing can prevent access by deer and livestock into riparian areas and allow alders and willows to regenerate. One type of fence that has been shown to be effective and economic in this bioregion is a curtain fence. This is a six-foot fence hung with #12 wire from a 1/8 inch, high-strength cable. It is stretched long distances (up to 400 feet) between trees, eight or nine feet off the ground. The fence is tensioned horizontally and staked to the ground. A project on Feliz Creek in southern Mendocino County using this fencing, funded in part by the California Forest Improvement Program (CFIP), showed almost immediate results in regrowth of alders. After one year the

trees were up to six feet tall. Benefits were not just for deer habitat; steelhead also returned to the stream, and no doubt a variety of songbirds and other wildlife benefitted. For more information on this type of fencing and to see a demonstration, contact the University of California's Hopland Research and Extension Center (707-744-1424) in Mendocino County.

Degraded riparian areas and oak woodlands can be improved by planting riparian vegetation such as willows and oak seedlings and acorns. See the previous section on Planting on page 50.



B. Cascade/Great Basin

1. Deer Habitats and Ecology

Most deer in the Cascade/Great Basin bioregion are migratory, although there are some populations of deer that remain all year on areas used as winter ranges by migratory animals. Great Basin shrub habitats are the most important winter ranges. These are dominated by bitterbrush, big sagebrush, and mountain mahogany; juniper woodlands and even cheatgrass-dominated areas with trace amounts of shrubs also are occasionally used. Many deer in this region cross the state line and winter in Nevada. Management authority for them is shared with the Nevada Department of Wildlife (NDOW). In addition, some populations summer in Oregon and winter in California, and these are managed in cooperation with the Oregon Department of Fish and Wildlife.

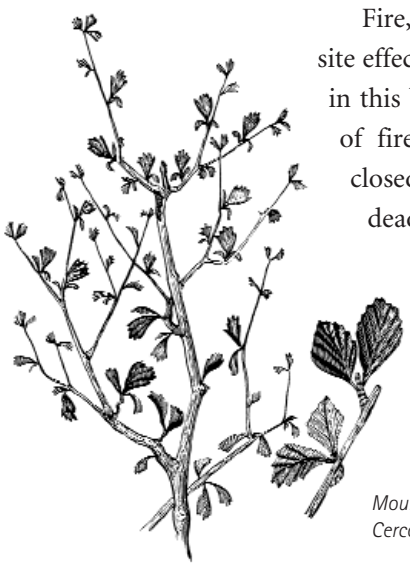
In summer, higher elevations with montane shrubs such as mountain whitethorn, tobaccobrush, deerbrush, bitterbrush, and areas with willows,

Opposite Page: *Common habitats of the Cascade/Great Basin bioregion include bitterbrush and big sage similar to this deer winter range in Lassen County.*
Photo by Eric Loft

aspens, and cottonwoods are most important. Forbs (small herbaceous annual plants) and grasses are eaten in the spring and early summer. Oaks–both black oak and Oregon white oak–and the acorns, leaves, and mistletoe they produce are especially important in the fall and winter. Acorns in particular provide an abundant source of nutrition during the period when much of the vegetation is dry and of low quality.

2. Limiting or Important Habitat Factors

The availability and condition of montane shrubs at higher elevations and Great Basin shrub-steppe habitats on winter ranges are the most important factors in this bioregion. These habitats provide both food and cover, but primarily food, for deer. The distribution and diversity of shrubs, the size of the "patches" in which they occur, and their relationship to water and the quality of cover are of primary importance. Also of concern is access to snow-free winter ranges; migration corridors free from human developments or disturbance must be maintained. Riparian areas are frequently degraded by livestock and, in places, wild horses.



Mountain Mahogany
Cercocarpus betuloides

Fire, or its absence, has profound but opposite effects on summer and winter deer habitats in this bioregion. On summer ranges, decades of fire suppression have resulted in dense, closed-canopy forests with an understory of dead or decadent shrubs that provide little nutrition for deer. In contrast, on many

winter ranges, fire carried by the introduced cheatgrass has burned off the bitterbrush and sagebrush that deer require to get through winter. Once established, cheatgrass is nearly impossible to eradicate. It forms a carpet of fine fuel that burns frequently and prevents reestablishment of the more desirable shrubs such as bitterbrush and big sagebrush. This can effectively destroy deer habitat permanently.

The establishment of residential developments on private lands in Nevada and California also is of concern to deer managers. Both CDFG and NDOW review proposed developments with county planning departments, and occasionally oppose them because of their impacts on critical deer habitats. This opposition is often supported by conservation organizations.

3. Major Land Practices

Timber production and livestock grazing are the most important land management practices affecting deer habitats in this bioregion. The most important landowners are the USFS and BLM (Figure 5 on page 30). Most timber harvest occurs on deer summer ranges in the form of selective logging and salvage. Fire is actively suppressed. Fuels reduction and biomass harvest from densely stocked conifer forests, in which small-diameter stems are removed from the forest stand, are also common practices. On the winter ranges, the major land management activity is livestock grazing. The proliferation of subdivisions is becoming increasingly important in the loss of deer habitats

4. Habitat Improvement Practices

The absence of large-scale disturbance has resulted in the diminished quality of deer summer habitat in the region. Like in other Northern California bioregions, what is needed is to produce early successional vegetation, namely shrubs and herbs, and then not hurry it along into later successional types such as closed canopy forest with a poorly developed understory. More patch cuts, which open the tree canopy, will favor deer. So will not suppressing shrubs after trees are harvested. On moist areas of summer range that have been degraded by livestock, fencing of riparian habitat and planting willows, if subsequently protected from grazing, can be effective.

Controlled burns should be encouraged on summer ranges. Reforestation

Big sage is an important shrub species in the Cascade/Great Basin bioregion.
Photo by Paul Wertz

following catastrophic wildfire should accommodate the development of understory shrubs, important components of habitat for deer and other wildlife. Broadscale application of herbicides to suppress the understory should be discouraged. Fuels reduction and biomass thinning have the potential to open the canopy and favor growth of the understory; however, such benefits are yet to be documented in practice. Mechanical removal of vegetation does not provide the same factors, such as heat and mineral input, that fire does, and by stimulating tree growth, it may suppress the understory.

On the winter range, the major land management activity is livestock grazing. Appropriate livestock control is important here, so that some of the annual production of forage is available for deer and does not go entirely to livestock. Fires that kill bitterbrush and sagebrush and allow the spread of cheatgrass should be suppressed; firebreaks around critical shrub habitats may be appropriate. Planting bitterbrush following fire on east-side ranges can rehabilitate deer habitat. Seed used should be from a local source, and young plants must be protected from browsing by wildlife and livestock for several years.