



V. Habitat Improvements

There is a large body of knowledge on manipulating habitats to benefit deer. A good, comprehensive source of information is the book *Techniques for Wildlife Habitat Management of Uplands* by Neil F. Payne and Fred C. Bryant (McGraw-Hill, 1994). In addition to the landowner and local wildlife experts, this is a good reference to consult when planning any particular deer habitat improvement project. We will discuss several types of habitat improvement practices in general terms here; more specifics are included in the bioregional sections. It is critical that you keep the big picture in mind when planning habitat improvements, as discussed before in Section II(C) on page 25.

Any particular projects you are considering should be discussed with and reviewed by local experts, and must be appropriate for local conditions. Consider deer habitat in the larger context of tens of thousands of acres, and not just the particular project area you are working in. For example, when working with a federal land-management agency on a particular controlled burn, you need to focus beyond the individual site and be sure that the project will work in concert

Opposite Page: *Using a drip torch to initiate an "understory" burn can significantly improve deer forage. Key deer forage plants often respond well to periodic burning such as this burn project in mixed conifer-hardwood stands of the South Sierra Nevada bioregion.*

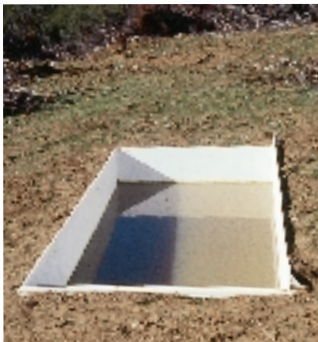
CDFG File Photo-Region 4

with other burns in the entire watershed. It is the sum total of all the burn projects that will have a positive effect on the deer population, not the individual burn itself. Get suggestions from, and coordinate your efforts with, the CDFG field biologist in your area, and with other agency personnel as appropriate.

A. Water

The availability of water influences the distribution of most wildlife populations. Obviously, the need for water is most apparent in arid regions. However, simply putting water in an area that lacks deer does not ensure that the deer population will increase. Developing a water source without regard for the availability of food and cover is a waste of time and money. In arid areas where water developments may be helpful to deer, consideration also must be given to livestock and feral animals such as burros that may use the water. In some cases this interaction may lessen the positive effect of the water project for deer.

In their book, *Techniques for Wildlife Habitat Management of Uplands*, Payne and Bryant discuss several ways to make water sources available to livestock and wildlife. Additionally, they offer designs to exclude livestock. They also present designs for a variety of water sources, both natural watering points such as



Left: *Big game guzzlers, such as this one in the Central Coast bioregion, collect rainwater and make it available to deer and other wildlife during the dry part of the year.*



Right: *Using a tractor to create small ponds provides water for deer and other wildlife.*

Photos by Phil Pridmore



Left: CDF helitorch burns chaparral in the South Coast bioregion. Because of dense chaparral the only practical way to effectively burn large areas is to use a drip torch suspended from a helicopter.

Photo by Jim Davis



Right: Cool "understory" burning in conifer stands creates deer forage while not harming the trees.

Photo by Ron Bertram

springs and seeps and artificial watering points such as guzzlers and reservoirs. An organization called Desert Wildlife Unlimited (619-344-7073) is particularly experienced in water developments for burro mule deer and other wildlife in southern California. All plans for water developments must be carefully thought-out, however, and discussed with the local CDFG and other agency personnel.

B. Controlled Burns

Any ecological change, including fire, will benefit some species and harm others. It is also true that fire can benefit deer habitat in some areas and destroy it in others. Much of California's vegetation is adapted to fire; it may be particularly flammable, or may sprout or its seeds germinate after fire. The young, rapidly growing vegetation that appears after burns in fire-adapted vegetation is highly nutritious and valuable for deer. Classic examples of such vegetation are in California brushland areas, where plants like deerbrush and whitethorn follow fires and provide valuable forage.

Fire can also degrade deer habitat. On drier ranges, such as those that receive less than about 10-15 inches of rain per year, plants may not respond positively to being burned. This becomes more true as the area becomes more arid. The effects of fire on bitterbrush, for example, are quite variable. In some areas, under certain



Top: Chamise responds well to fire. Note the young sprouts at the base of the burned plant. These sprouts are excellent deer forage during the spring. However, chamise will be used by deer throughout the year when available and palatable.

Photo by Jim Davis

Below: The use of a "ball and chain" can help prepare a site for burning or act as a form of mechanical disturbance, setting succession back and encouraging sprouting.

CDFG File Photo--Region 3

On gentle terrain a tractor can be used to prepare a site for burning or act mechanically to disturb the habitat, creating early successional vegetation favored by deer.

Photo by Ron Rempel



conditions such as high soil moisture, bitterbrush may resprout after burning and improve a winter range. In other circumstances, burns may kill bitterbrush and allow cheatgrass (a non-native, annual grass) to become established. The cheatgrass may then burn frequently, every 5 to 7 years, preventing the reestablishment of bitterbrush and sagebrush and resulting in much poorer deer habitat.

Thus, when evaluating burning as a management tool to improve deer habitat, you must take into consideration the location and general ecological conditions, plant species present, amount of yearly rainfall, and the season. For example, if your goal is to improve the amount and vigor of ceanothus brush species, a desirable deer forage, you must know which species of ceanothus grows in the area. Species such as mountain whitethorn and tobaccobrush are vigorous sprouters and can be managed with winter or spring burns, when fire hazard is low. With other species, you should avoid burning in the spring, which may eliminate them from the area burned. In some areas, especially those with higher precipitation or during wet years or seasons, burning may be beneficial and should be encouraged; in others, fires should be avoided or suppressed. As always, discussions with local experts must be part of planning the project.

The management of forests following large wildfires is of great concern to those interested in deer habitats. Following extensive wildfires, forest managers often want to plant conifers and suppress the brush that competes with them. It is the resulting brush after fires that is so valuable to deer. Brush suppression often is done chemically, with aerial spraying of herbicides over large areas or through hand application. This activity can greatly decrease the value of such fires to deer habitat.



Riparian habitat composed of meadow vegetation. Adjacent to the meadow is a stand of aspen. These riparian and aspen habitats are important to deer— especially lactating does.

Photo by Eric Loft

C. Riparian

Riparian areas, those associated with standing or running water, provide important deer habitat in several ways. The lush vegetation associated with watercourses provides cover for fawning and concealment, and provides nutritious forage. In many locations of the state, riparian areas offer the only green vegetation in late summer. Consequently, it is these areas that frequently receive the heaviest use, both from livestock and from wildlife, including deer. Controlling livestock stocking rates, typically by fencing or herding, is the best way to manage these areas. The reduced browsing pressure then allows plants to regenerate. This process may be accelerated by planting riparian vegetation such as willows. However, after the vegetation has recovered, browsing pressure must be controlled or the riparian habitat again will be degraded. In some areas, especially northwestern California, excessive deer browsing also can have detrimental effects on these riparian areas.

D. Planting and seeding

One way to revegetate degraded or burned land is to plant or seed desirable vegetation. Willow cuttings are often planted in riparian areas to rehabilitate streams, springs, or meadows that are overgrazed; bitterbrush is often planted from seed on winter ranges that have been burned or mechanically treated. Oaks can be planted from acorns or seedlings.

Several important factors need to be considered when evaluating the possibility of planting or seeding. The first is that plant species native to the project area should be used. Planting mountain whitethorn on a Great Basin winter range, or bitterbrush in coastal oak woodlands, would be a waste of time, money, and effort because the species do not naturally occur in these areas and would not survive. Second, use seeds or seedlings from local sources. For example, acorns collected from blue oaks on the coast, adapted to relatively cool, moist conditions, would probably do poorly if planted in the hot, dry

Opposite Page: Interior live oak acorns. Acorn mast, when available, compose a large part of a deer's diet during the fall and early winter. Acorn production is often unpredictable. Therefore, maintaining a diversity of oak species increases the probability that acorns will be available each year.

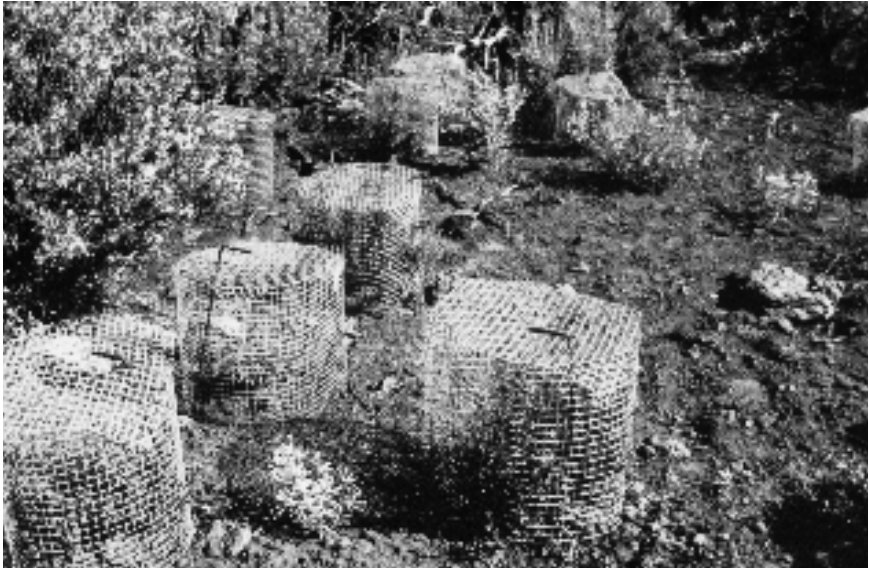
Photo by Kent Smith

A tractor is often used to prepare a seed bed to establish deer and other wildlife forage.

CDFG File Photo—Region 4







It is often necessary to protect new plants from deer, livestock and rodents. Excessive foraging can retard or completely eliminate new plant development.

CDFG File Photo—Region 3

Sierra foothills. Third, the plants to be used, even if native to the area, must be appropriate for the local ecological conditions. For example, willows require moist soil; they will not grow on rocky uplands. Thus, if you are interested in rehabilitating an area by planting or seeding, learn what plants are native to the area, appropriate for the particular ecological conditions, and provide good deer habitat. Discuss your ideas with the local CDFG biologist, and with USFS or BLM biologists, botanists, or range conservationists.

For the most comprehensive source of information on planting and managing oaks and oak woodlands, consult the Integrated Hardwood Range Management Program at the University of California, Berkeley (510-643-5429). Several of their publications are of particular value for planning habitat improvement projects in oak woodlands. *Guidelines for Managing California's Hardwood Rangeland* (University of California Division of Agriculture and Natural Resources Publication 3368; 1996; \$15.00) is a recent, comprehensive guide to managing oak woodlands. The pamphlet *How to Grow California Oaks* by Douglas D. McCreary discusses issues such as col-

lecting acorns and the maintenance and protection of seedlings and lists nurseries producing native oaks in California. Two documents by Sharon G. Johnson, *Wildlife Among the Oaks - A Management Guide for Landowners*, and *Living Among the Oaks - A Management Guide for Landowners* present information on how people can manage and enhance oak woodlands for wildlife habitat and other environmental values.

E. Fences

To exclude animals from certain areas such as springs, creeks, and meadows, it is often necessary to construct a fence. There are many fence designs appropriate for various objectives, such as excluding livestock and accommodating wildlife, or excluding both livestock and wildlife. Some fences are permanent, others can be easily lowered seasonally to allow animal passage or to avoid damage from snow. The Payne and Bryant book *Techniques for*

Protecting important deer habitat, such as this aspen stand, from livestock, can be as simple as felling trees at the margins of the stand to block livestock access.

Photo by Brian Barton





Fence construction is an important consideration. Note that the fence has five strands of barbed wire, with the bottom wire nearly 24 inches off the ground. A "deer friendly" fence should be no more than 4 strands of barbed wire with the bottom wire 18 inches above the ground to allow fawns easy passage, while blocking access to young livestock.

Photo by Brian Barton



Fences constructed with more than four strands of barbed wire can increase deer mortality. This six strand barbed wire fence was too much for this deer to negotiate.

Photo by Ken Mayer

Wildlife Habitat Management of Uplands presents many fence designs for various purposes.

The practice of felling trees to block access by livestock to riparian areas or aspen stands, although not technically fence-building, accomplishes the same goal, and has been successful in particular cases.

F. Funding of Projects

There is a variety of programs that can supply funds for wildlife habitat enhancement projects. Here we mention only a few. More information is available in a document titled *Cost Share and Assistance Programs for Individual California Landowners and Tribes* available at no cost from Cooperative Extension Forestry, Department of ESPM, University of California, Berkeley (telephone 510-642-2360). Some of the programs most relevant to deer habitat include the following:

1. The **Vegetation Management Program (VMP)** of the **California Department of Forestry and Fire Protection (CDF)** has as its goal the use of fire to control unwanted vegetation that creates wildfire hazards. Benefits may include improving wildlife habitat. In this program, CDF conducts prescribed burns on private lands, and pays up to 90 percent of the cost. Contact the VMP program manager, CDF, Sacramento at 916-653-9447.

2. The **Private Lands Wildlife Habitat Enhancement and Management Area Program (PLM)** of CDFG provides incentives to private landowners to enhance wildlife habitat on private lands. The landowner must develop a 5-year management plan and conduct habitat improvements. In return, the landowner is provided by the Commission and CDFG flexible, biologically sound hunting seasons and bag limits. The fees collected by the landowner for hunting on the land are used to offset the costs of habitat improvements made on the property. Contact the appropriate CDFG Regional Office, or the statewide PLM Program coordinator at 916-653-1777.
3. The **California Riparian Habitat Conservation Program (CRHCP)** of CDFG seeks to protect, restore, and enhance riparian habitat throughout the state. It offers grants to local, state, and federal agencies, resource conservation districts, and non-profit public benefit corporations for restoration projects such as fencing. Contact the program coordinator at 916-445-1072.
4. The **Deer Herd Management Plan Implementation Program** of CDFG seeks to restore and improve deer habitat in California. Any public organization with land-management responsibilities wanting to improve deer habitat may submit project ideas under this program. Contact the statewide program coordinator at 916-653-7203.
5. The **Mule Deer Foundation** is a private, non-profit organization that is dedicated to improving North America's mule and black-tail deer populations. It funds a variety of habitat-improvement, research, and other projects, such as this document, to benefit mule deer. They can be contacted at 888-375-DEER.
6. The **California Deer Association** is a private, non-profit organization that is dedicated to improving deer habitat and populations in California. It funds a variety of habitat improvement, research, and other projects to benefit mule deer. They can be contacted at 831-757-0142.