

Response of Deer to Fuel Management Programs in Glenn and Colusa Counties, California¹

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Deer are the most numerous and popular big game animal in the State of California, with a reported hunting harvest of 32,377 in 1980. Herd populations statewide have suffered long-term declines since 1954 when a high of 75,602 animals were harvested. This report deals specifically with Columbian blacktail (Cervidae Odocoileus Columbianus) of the Coast Range Mountains of California, not the mule deer species of the Sierra Nevadas and south coast, even though many requirements and management implications are similar.

Glenn and Colusa Counties are located on the western side of the Sacramento Valley, about 100 air miles north of San Francisco. The western parts of the counties are largely public lands, varying from oak-grass foothills at lower elevations through large expanses of chaparral into timber-covered higher mountains. For management reasons, the deer are biologically grouped into what is known as the Alder Springs Herd.

The Alder Springs Herd suffered the same decline in population experienced by most of the herd units statewide. Historically, this Herd annually harvested 1,300 to 1,500 animals during the 1950's and early 1960's, falling steadily to 300 to 400 during the 1970's. Deer need a proper mix of season-long forage, escape and thermal cover, useable water, and a degree of solitude during fawning periods to maintain or increase their populations. By 1970, the Herd Unit was characterized by large stands of over-mature chaparral that had developed from large wildfires of the late 1940's and early 1950's, mature stands of old-age conifers or thickets of sapling-sized conifer regeneration where logging had occurred, and even-aged stands of blue-oak, high-lined through browsing. This habitat situation had developed over time, due primarily to a fire protection policy that has suppressed all fires at the smallest possible acreage and timber policies that allowed slash to accumulate in unnatural amounts and minimized surface disturbance. Such

¹Presented at the Symposium on Dynamics and Management of Mediterranean-type Ecosystems, June 22-26, 1981, San Diego, California.

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Abstract: Seven years of an active, coordinated, fuel management program on the Mendocino National Forest has led to a 300 percent increase in the deer population, improvement in their condition, increase in their available range and redistribution of populations. It has not led to significant increases in hunter numbers nor serious conflicts with other resource uses of the same area.

policy inexorably led to old-age stands of vegetation exhibiting little diversity, with occasional large-acreage wildfires that burned intensely.

Most of the local chaparral and timber-related browse species require fire as a rejuvenating part of their life cycles and provide excellent deer forage when young. A large wildfire increases the amount of forage (brush sprouts and forbs) dramatically but sets up a "feast or famine" situation. Animal populations start to rise dramatically after a fire, only to quickly return to previously low levels as the brush species mature, forbs are eliminated by brush, and protein levels decline (3 to 5 years). Also, deer do not have the biotic potential to effectively use all the forage created by the large fire, and finally, forage is only one of the requirements of their life cycle. Mature, heavy stands of vegetation also significantly lower supplies of available water, another important need of all wildlife.

The Department of Fish and Game and the Mendocino National Forest began in 1973 to try to change the essentially unmanaged, custodial situation into an actively managed one. Our goal was to increase overall land productivity and managerial effectiveness, with objectives specifying increased populations of wildlife, more available water, additional cattle grazing and less large wildfires. Today, we actively pursue four programs, always cooperatively on the ground.

Specifically

1. Prescribed burning of chaparral stands, keyed to individual 20-to 50-acre (8-to 10-hectare) burns occurring over a 25-to 30-year rotation. This program has annually treated an average of 2,000 acres (800 hectares) per year since 1973.
2. Prescribed burning of summer dormant perennial grass fuelbreaks and type conversions established within the chaparral type in the late 1950's and early 1960's. This program started in 1978 and treats 500 to 600 acres (200 to 400 hectares) annually, with a rotation (reburn) occurring at 10 years.
3. Underburning of conifer stands with disposal of logging slash.

4. Coordination of management activities of other programs, i.e., fuel reduction, timber management, range, recreation, etc. with deer management program objectives.

Deer Response To These Four Programs Has Been As Follows:

1. Deer population, measured through utilization studies and license returns, has increased by approximately 300 percent since 1973 on over half of the herd range (the half that has received the highest level of project work).
2. The condition of the deer has visibly improved. Fawn production has increased; spring fawn survival is high; deer are fat and "clean" with few parasites and even less disease; the average weight per buck taken has increased approximately 20 percent field-dressed; 3 point and better horn classes have increased by 18 percent.
3. Deer ranges have both expanded and modified.
4. There has been an increase in public use of the land.

What has caused these responses? Naturally, the four programs have been responsible, but why? To the best of our ability to measure, specifically:

1. Prescribed burning of chaparral results in a flush of nutritious forage with high protein levels for about 3 years, then returning to levels associated with "old brush", high enough to maintain life but little else. Our small burns, recurring within each watershed each year, build and hold a forage level that is available for the increased populations during the time of each year that it is needed.
2. Prescribed burning of perennial grasses removes dry matter and evidently supplies nutrients for the plant. Available forage doubles the first year and holds for at least 3 years (we don't know how much longer yet; the first grass burns occurred 3 years ago). The ashes also cause the grass to begin growth about two weeks earlier, important for a deer range. Also, we know that a prescribed burn of an annual grass type stimulates and increases filaree and clover, preferred by deer over grass. This also comes earlier, increases deer use per land unit by about 25 percent and is an important early spring feed.
3. The scattered nature of smaller prescribed burns creates maximum edge, but also as importantly, keeps escape cover handy, almost 100 percent available at any time.

4. Each acre (4 hectares) of chaparral burned produces an additional 100,000 gallons (380,000 liters) of water the first year, declining to normal (pre-burn) yield at about 15 years. About half the increase comes as extended season supplies for springs, seeps, and intermittent streams. Water sources increase, in good location to available forage, often including an increase in riparian vegetation, especially important for fawning.

5. Deer populations have moved into treated areas previously unused, even sometimes leaving cultivated fields for improved foothill range. More use is made of transition ranges, saving summer range. Our work has tended to redistribute the increased population, probably an important factor in the low incidence of disease within the Alder Springs Herd.

6. Large wildfires have been kept from the Herd Unit since the start of the programs. This is partially due to recognition of the fact that such fires are not desirable for managing a deer population. Once this is agreed, it is easy for the biologist to support larger first entry burns that do not maximize edge but prioritize protection against the large fire. Second and third entry burns are smaller, serving to maximize edge, water increase, etc. once the overall fire threat is significantly abated via the first entry.

7. Use of, and products from, the land increase. The same area that supports the 300 percent increase in deer, also grazes almost 4 times the original numbers of cattle, sheep and goats for carefully selected periods of the year. Sheep and goats are considered as tools for deer management by the biologist. Research shows that carrying capacity for deer and soil productivity is higher when sheep forage the same area under controlled conditions.

Users get to see more wildlife and we have a hunter success rate calculated at 27 percent. Also, public safety is increased for the users.

The things we knew and have recently learned were embodied in the Alder Springs Deer Herd Management Plan developed in 1979. This Plan deals with both the deer and their habitat and was approved by the Department of Fish and Game and Mendocino National Forest. It describes the existing situation; sets herd goals for numbers, conditions, level of use; analyses what work is needed to reach them; and develops an action plan. A key part of the Plan is Habitat Models describing the condition desired for chaparral and conifer vegetation types. The four programs previously mentioned are some of the ways we seek to reach the agreed Models. The responses we have measured indicate movement toward goals.

HABITAT MODELS PER 1,000 ACRES (400 HECTARES)

Chaparral Vegetation Type - 50 Percent Cover

5 percent thermal (overstory).

25 percent hiding (including chamise If years old),

10 percent fawning in 8 to 10 acre cells (55 percent palatable grass and forbs), 30 percent accessible brush (50 to 70 percent crown closure), and 15 percent dispersed overstory (10 to 30 percent crown closure).

10 percent optional (to be treated on a case-by-case basis toward the limiting factor for that management unit).

Chaparral Vegetation Type-- 50 Percent Forage

10 percent perennial grass and forbs.

15 percent annual grass and forbs.

10 percent oaks (oak and grass type).

15 percent new brush (1 to 3 years).

Chaparral Vegetation Type

Water within one-third mile (.53 kilometers) radius (essentially a non-linear supply situation).

Solitude for the fawning period (starting May 1 at lower elevations, continuing to June 15 at higher elevations).

Mixed Conifer Forest Vegetation Type (includes transition range)

10 percent meadow or glade.

15 percent browse.

15 percent immature timber (shrub, seedlings, saplings).

20 percent open timber (less than 50 percent crown closure).

Closed stand of mature timber (50 to 100 percent crown closure).

Oaks (a minimum of 200 square feet per 40 acres), (18 square meters per 16 hectares).

Water (three sources) (essentially a linear supply situation).

Solitude (June 1 at lower elevations, to July 15 at upper elevations).

In conclusion, 7 years of experience with an active fuel management program has resulted in a significant increase in the deer herd, healthy, larger, animals in better condition, more evenly distributed throughout their natural range. The hunter success rate is high and everyone is pleased with the results to date. An economic analysis based on the 7 years of project costs, compared to values of deer, water, livestock forage and fire suppression savings, shows an 8.1 benefit cost ratio at a 10 percent discount rate.

Equally significant are the things that have not happened. We have not experienced an overwhelming increase in hunters. Serious conflicts with other uses and users have not developed, and finally, the public continues to actively support, and cooperate with the program.