

CATTLE GRAZING ON WESTERN PINE PLANTATIONS IS COMPATIBLE WITH MULE DEER SUMMER RANGE USE

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Abstract: A grazing plan that allows intensive grazing of ponderosa pine and lodgepole pine plantations was compatible with summer range use by mule deer. Livestock control by riding, salting, and water development, with emphasis on early plantation grazing and deferred meadow use, resulted in seasonal optimization of forage use by both cattle and mule deer. A carefully designed forest grazing program benefits foresters, ranchers, and deer. Cattle grazing reduces fuels and unwanted herbaceous vegetation on pine plantations, and provides an income to the forest land manager. Ranchers gain access to valuable summer forage. Deer forage quality is improved, while fawning habitat is protected.

Weyerhaeuser Company's Eastern Oregon Region land base consists of 650,000 acres of timberlands that lie in Jackson, Klamath, and Lake counties of Oregon, and Modoc County of California. The climate is typified by dry summers and cold winters. There are typically 90 to 135 frost-free days, depending on aspect and elevation. The elevation ranges from 3,000 feet in Jackson County to 7,500 feet in Lake County, and rainfall varies from 16 to 40 inches with an average of 20 to 25 inches. The soils in the Klamath Tree Farm area range from a Mount Mazama pumice overlay to stony clay loams. The primary tree species are ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), white fir (*Abies concolor*), Douglas-fir (*Pseudotsuga menziesii*), and several minor species such as incense cedar (*Libocedrus decurrens*), western juniper (*Juniperus occidentalis*), and sugar pine (*Pinus lambertiana*).

Grass and grasslike transitory vegetation in plantations, while varied, consist primarily of bottlebrush squirreltail (*Sitanion hystrix*), Ross' sedge (*Carex rossii*), Western needlegrass (*Stipa occidentalis*), mountain brome (*Bromus marginatus*), and Kentucky bluegrass (*Poa pratensis*). Broadleaf plants include Western yarrow (*Achillea lanulosa*), broadleaf strawberry (*Fragaria virginiana*), bluelips (*Collinsia parvifolia*), and phacelia (*Phacelia hastata*). Brush species are snowbrush (*Ceanothus velutinus*), greenleaf manzanita (*Arctostaphylos patula*), and bitterbrush (*Purshia tridentata*).

Livestock graze intensively throughout the tree farm in conjunction with public land allotments managed by the Bureau of Land Management and U.S. Forest Service. Mule deer (*Odocoileus hemionus*) use the tree farm for summer range and migrate to lower elevations and agricultural lands for winter range. In 1985, the herds using the area are the Interstate Herd and the Silver

Lake Herd. Populations have traditionally been controlled by the availability of winter habitat.

By 1974, the artificial regeneration of ponderosa pine and lodgepole pine was perfected and even-age stands were established on 120,000 acres of the tree farm by 1985. Livestock began being used as a tool for vegetation control in 1980 as a result of an extensive tree and livestock study completed by Western Range Service of Elko, Nevada (Monfore 1983). The grazing methods that resulted from that study were put into operation on 18 allotments encompassing 600,000 acres of Company lands by 1983. Following are the basic grazing management actions:

(1) Early location of livestock on the allotment is achieved using bottlebrush squirreltail as a key range readiness indicator. Livestock entry on the allotments occurs by 7 May to 10 June, depending upon elevation.

(2) Livestock are moved directly onto plantations, distributed, and held on the plantations so as to uniformly crop the initial forage growth and subsequent regrowth at the time of optimum nutritional value. This early-heavy use stimulates vegetation regrowth which remains highly palatable until August.

(3) Major meadows and riparian areas are deferred until later in the season (about 1 August). Livestock are then moved from plantations to these areas.

(4) Herd control is achieved through intensive riding to maintain distribution, use, and deferment objectives.

(5) Herd numbers are established based upon a detailed carrying capacity analysis and adjusted as plantation development occurs. (Korpela 1983).

(6) Water development consisting of ponds, springs and reverse drainfields were constructed to gain maximum animal distribution when correlated to existing natural water sources. Over 160 successful

developments have been constructed since 1979.

These activities have resulted in a substantially uniform moderate to heavy grazing of the plantations. Currently, plantation forage is utilized at a rate between 50% and 70% (sometimes as high as 90%), while deferred meadows and riparian areas are utilized at a rate between 30% and 50%. The grazing timing, intensity, distribution, and deferment of grazing, as well as water development, all lead to a forage use pattern that observations indicate are complementary to and compatible with mule deer summer range usage.

INTEGRATION OF DEER AND CATTLE USE

The following observations and discussion would pertain to most of the allotments on the tree farm. The principal allotment discussed is the Pothole Allotment. This allotment consists of 66,601 acres of which 45,716 are National Forest and 20,885 are Weyerhaeuser Company lands. There are approximately 9,800 acres of plantation, 6,100 acres of mountain meadow, and 2,800 acres of riparian corridor. The remaining 47,901 acres are dominated by residual stands of 30 to 150 year old white fir, ponderosa pine and lodgepole pine, as well as occasional scattered overstory of white fir and ponderosa pine of 200 to 450 years of age. Cold air drainage areas have more solid stands of lodgepole pine 150 years of age.

The Interstate Deer Herd migrates to and from this summer range each year. In 1985 the Oregon Department of Fish and Wildlife estimated the current herd population at 9,400 animals, a portion of which use this allotment. The overall population level of these animals is controlled primarily by winter range conditions.

Deer use patterns were studied during the 1979, 1980, and 1981 seasons by aerial observation using a Bell 206 Jet Ranger helicopter, and by ground observation through the 1985 season. Deer observations consisted of noting use patterns during the early morning, mid-day and evenings in plantations, residual stands, and near waterholes. Feeding observations were made and to a lesser degree riparian area use was recorded. Season of observation was limited from the third week in April to the first week in November.

Lay (1969) found that forage diversity is a key to deer habitat quality. The diversity in this area was high due to past fires, logging and regeneration activities and natural meadow conditions. Summer

range condition is excellent. Plantation transitory vegetation is principally fast growing and in a vigorous growing condition for much of the season where plantation grazing treatments are applied. Forest vegetation (residual and overstory tree stands) quickly matures and moves toward a reproductive stage which results in lower forage palatability and longevity. Meadows are characterized by lush and proliferous early growth of grasses, sedges, and forbs which normally maintain a high palatability until early September.

Juikander et al. (1961) reported that poor summer ranges resulted in reduced reproductive capacity of deer. A corresponding healthy summer range increased the reproductive capacity. Observations showed that the majority of does were noted as having twins while few barren does were observed. Harvested animals exhibited large fat deposits and marbled meat conditions even during the dry 1985 season.

Loveless (1967) observed that deer prefer forage in conjunction with cover, while Mackie (1970) and Skovlin (1967) observed that mule deer local and seasonal movements were affected by the quantity and quality of forage. Wallmo et al. (1972) found that the forage consumed by deer was highest (63%) in strip clearcuts, with lesser amounts (27%) being from uncut stands and the remainder from roadsides. Skovlin and Harris (1979) observed that increases in cattle stocking rates did not significantly alter deer use in the livestock grazing area. Observations in the Pothole allotment were consistent with these findings.

Edgerton (1972) found that partial cuts provided cover and hiding grounds, while clearcuts provided an increased food supply. The combination of plantations and residual stands on the allotment fit this scenario perfectly. In the study area, deer were typically observed to use the residual stands for cover and to feed in the plantations during the late afternoon, evening and early morning. During feeding, the deer tended to disperse throughout the plantation. If threatened, they always ran to the nearest residual patch for cover. Rarely were deer observed feeding in the residual stands. Residual stands that had been precommercially thinned appeared to be used extensively for the next two years after thinning. Deer bedded down in such a way as to have good vision of the surrounding area. Due to predator noise and high visibility, risks of predation were low.

Edgerton and Smith (1971) observed that

deer would shift away from succulent forbs as they matured. The shift was to browse species in forested areas. In these areas, grazing by livestock in the plantations kept many plants in a succulent vegetative regrowth condition. Deer were observed continuously feeding on this regrowth. One curious observation found that does seemed to prefer the regrowth of Ross' sedge during August and September to other species. At times these deer were so intent in feeding on sedge that an observer could walk to within a few feet of the animals.

Wilkins (1957), Julander et al. (1961) describe deer shifting from forbs to browse in late summer and early fall. In studying plantation forage development on the tree farm, Korpela (1983) found that the nutritive value of plantation forage decline by late July or early August. Deer were observed, however, in this area to continue to use the plantation regrowth vegetation throughout the summer and more heavily in the fall after livestock were removed, especially after early fall rains stimulated forb growth activity. Because of the heavy livestock grazing in the plantations, transitory vegetation became palatable earlier the following spring.

Julander (1955) observed that competition or complementary forage conditions were affected by stocking numbers of cattle, range condition, and overall competition. Hedrick (1969) observed that competition between deer and cattle could be managed by intensity of use, season of use, and distribution of livestock. Mackie (1970) found that grazing competition was most acute early in spring and late in the fall, however some browse species were made more palatable and preferable to mule deer as a result of cattle grazing. Fulgham et al. (1981) found that spring sheep grazing of mule deer habitat at 70% utilization levels was in fact was beneficial.

In this allotment, plantation forage was more palatable in early spring for deer due to the heavy livestock grazing the previous summer. After cattle were moved from the plantation to the meadows in August, the deer continue to use the plantation regrowth throughout the fall. Consequently the deer benefited both spring and fall from the prescribed grazing pattern.

Stuth (1975) found that cattle used only 5.2% of transitory plantation forage with meadows reaching 60% utilization due to lack of water and riding. As noted above, by developing water, initiating grazing earlier, riding and salting, this

trend was essentially reversed. Plantation forage was utilized up to 75% and meadows were used between 30% and 50%.

By deferring major meadow and riparian use until August, deer use of these areas was enhanced from May through July. Stuth (1975) observed that deer utilized forbs in meadows through July, then moved to actively growing shrubs. Reynolds (1974) observed that pregnant and lactating does require succulent diets and ready access to water. Meadow edges provided feed, cover, and water, as well as concealment for fawns. The most critical time period for this use was during the period of May through July. This corresponds to the time of deferment for cattle for meadow grazing due to the early plantation grazing treatments.

Further complementary effects of this type of allotment grazing in terms of browse species and grass and grasslike species exist. A host of studies well document this phenomenon (Smith 1949, Hubbard and Sanderson 1960, Hedrick 1971).

On the Pothole allotment, twelve usable water sources were developed to aid livestock distribution. Deer use of these water sources was highest in early spring through early summer, and again in late fall. Mid-summer use by deer decreased as water quality declined. Use did not decrease around spring-fed ponds where water quality remained high. Natural water occurs in live streams throughout the allotment and water shortage has not been a critical item for deer use.

MANAGEMENT CONSIDERATIONS

The Weyerhaeuser Company allotments currently are managed for optimum vegetation control in plantations. The Pothole allotment described above most nearly optimized cattle usage while enhancing compatible deer usage.

The combination of water developments, requiring riders and salting to achieve a well distributed and controlled livestock herd, balancing numbers of livestock with the overall allotment carrying capacity, and entering plantations early and deferring meadow and riparian use achieved a balanced livestock use pattern that was compatible with mule deer use patterns. Vegetation was managed so as to be complementary with mule deer needs and use, including maintenance of meadow areas for fawning and feeding by lactating does in the spring.

Not all allotments are as easily managed. The vegetation management concepts may be the same, but location of riparian areas and meadows may be such that

riding cannot achieve adequate deferment. Fencing is an expensive alternative. Studies are currently under way on an adjacent allotment and preliminary observations are encouraging. Certain riparian areas were fenced and livestock excluded. Fawning was observed at a high rate and lactating does preferred the areas much the same as the meadows on the Pothole allotment. Monetary returns on investment cannot be easily measured and the benefits are more biological and political rather than financial.

The livestock management activities noted above are costly for the rancher, but effective. Currently, the AUM charge is maintained at a low level (\$2.54/AUM) to keep the operation at a cost-effective level for the livestock operator. Benefits to the livestock operator are realized by increased livestock weight gains and increased numbers. Management plans must be coordinated between ranchers and adjacent landowners to ensure cooperation from each, and most importantly, to meet the objectives of each. If mule deer summer range were to be enhanced on all allotments as discussed, some compromises would be needed. Riparian zone fencing, increased riding intensity, and shorter grazing seasons would have to be considered on at least two of the allotments.

Livestock grazing must provide financial returns to both the operator and Weyerhaeuser Company in order to continue. Management to enhance deer habitat and deer productivity can be accomplished with minimum adverse impacts on most allotments. Some allotments, though, may have to be operated for the primary livestock and silvicultural objectives to remain cost-effective.

Further study of actual deer preference and use of plantations during and after heavy grazing by livestock is needed to document the effects of management changes on overall deer herd health and vigor. Such studies must also examine the winter range use and impact on herd numbers and vigor.

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