

# Livestock Grazing Impacts on Public Lands: A Viewpoint

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In recent years, livestock grazing on public lands has been a subject of considerable controversy. Groups advocating or opposing grazing on public lands have often based their arguments on emotion rather than fact. A discussion of grazing impacts on public lands based on available literature is overdue. It is my intent to emphasize the benefits of controlled livestock grazing to vegetation, water, wildlife and economic resources. It is recognized that uncontrolled livestock grazing leads to resource destruction. However, this also applies to mining, logging, farming, wildlife grazing, recreation, and practically any other land use when unregulated.

## Demand and Production

The demand for red meat is rapidly rising both in the United States and abroad (Council for Agricultural Science and Technology 1974). It is expected the world's population will increase 63% in the next 25 years (Bommer 1978). Several million acres of grassland are converted to cropland every year in the United States alone (Long 1974). Presently, consumption of red meat per capita in this country and overseas is also rapidly increasing (Bommer 1978). This three-way crunch suggests that demand will dictate that we drastically increase red meat production from federal lands rather than eliminate this area from our grazing resources.

The argument that livestock on public lands presently account for only a small part of total meat production is not true. Public rangelands provide about 12% of the forage consumed annually by domestic livestock (Council for Agricultural Science and Technology 1974). However, it was also reported that this information underestimates the importance of federal land because of the following:

- 1) The annual feeding cycle requires use of forage from federal rangeland, private rangeland and cropland.
- 2) Published statistics usually combine beef and dairy and do not distinguish between grazing and feedlot operations.
- 3) Values for specific products such as feeder calves and yearlings or sheep and lambs are not separated.

Therefore, federal lands are much more important than the available data indicate.

Red meat can be produced much more efficiently on rangeland than on cropland. This is because energy inputs in the form of

seeding, fertilization, irrigation, and harvesting are not required annually on rangeland (Cook 1974, Long 1974, Sisson and Box 1974, Council for Agricultural Science and Technology 1974, Workman 1975, Bommer 1978, Cook 1979). Long (1974) reported elimination or large scale reduction of livestock grazing on public lands would be wasteful of natural resources and could have serious effects on food prices and supplies.

## Grazing Effects

Vegetation is the common denominator regarding grazing impacts on rangeland ecosystems. The grazing animal affects vegetation directly by defoliation. The primary indirect effects of grazing on vegetation are the compacting or loosening of the soil profile and reduction of mulch and standing dead material.

Early range research was largely involved with studying the impacts of livestock grazing on rangeland vegetation when relatively little control was applied. However during the past 30 years there has been a tremendous increase in the knowledge available concerning livestock grazing impacts on vegetation when sophisticated management programs are applied which carefully control frequency, intensity and timing of grazing. Although this information has not been fully applied, it has resulted in great improvement of both public and private ranges. The Council for Agricultural Science and Technology (1974) reported most rangelands are better suited to all types of use today than they were before 1950. Criticism concerning negative impacts of uncontrolled livestock grazing on public lands has generally disregarded the benefits of controlled grazing. Positive influences of domestic animals on rangelands include the following:

- 1) Loosening of the soil surface during drying periods (Davies 1938, Campbell 1966, Savory 1978).
- 2) Removal of excess vegetation that may negatively affect net carbohydrate fixation and increase water transpiration losses (Daubenmire and Colwell 1942, May 1960, Baker and Hunt 1961, Williams 1966, Gifford and Marshall 1973, Thorn and Koller 1974).
- 3) Incorporating mulch into the soil profile which speeds development of humus (Dyksterhuis and Schmutz 1947).
- 4) Recycling nutrients in the ecosystem and making some nutrients more available (Petersen et al. 1956, Williams 1964, Lotero et al. 1966, Barrow 1967, Weeda 1967).

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- 5) Maintaining optimal leaf area index (May 1960, Jameson 1963b, Williams 1966, Brown and Blaser 1968, Ludlow and Wilson 1971, Vickery et al. 1971, Langer 1972, Robson 1973).
- 6) Trampling seed into the ground (Davies 1938, Tanganyika Agricultural Corporation 1961).
- 7) Reducing excess accumulations of standing dead vegetation and mulch that may chemically and physically inhibit new growth (Hopkins et al. 1948, Curtis and Partch 1950, Goodman 1953, Conrad 1954, Hopkins 1954, Hopkins 1956, Glendening and Pase 1964, Young and Hulett 1968).
- 8) Inoculating plant parts with saliva, which may stimulate plant regrowth (Vittoria and Rendina 1960, Reardon et al. 1974).
- 9) Reducing fire, insect, and rodent problems resulting from vegetation accumulation (Launchbaugh 1964, Smith and Doell 1968, Todd and Kamm 1974).

Several studies are available showing that controlled grazing has resulted in vegetation enhancement. Some of the more recent studies include Hanson et al. (1970), Currie and Smith (1970), Valentine (1970), Kothmann et al. (1975), Martin and Ward (1976), Reardon and Merrill (1976), and Skovlin et al. (1976). Considerable research is also available showing that lightly or moderately grazed plants are more productive than those left ungrazed (Nelson 1934, Weaver and Rowland 1952, Garrison 1953, Trumble and Woodroffe 1954, Jameson 1963a, Lay 1965, Laude et al. 1968, Willard and McKell 1973, Tueller and Tower 1979, McNaughton 1979). These studies suggest that elimination of grazing on federal lands would be wasteful and detrimental to the vegetation resource.

### **Watershed Effects**

Uncontrolled livestock grazing has resulted in watershed destruction in certain areas. However, controlled grazing is not detrimental to water quality and may increase water quantity. Skovlin et al. (1976) reported that 15 years of moderate cattle grazing under a deferred rotation grazing system at the Starkey Experimental Range and Forest in northeastern Oregon resulted in improved watershed mulch and vegetation cover. Buckhouse et al. (1977) found no difference in surface erosion between properly grazed and ungrazed areas. Dunford (1949) and Aldon (1963) reported that controlled grazing resulted in watershed improvement rather than deterioration.

In recent years, studies have been conducted investigating livestock influences on coliform bacteria numbers in water derived from rangelands. Buckhouse et al. (1977) and Buckhouse and Gifford (1976) found cattle grazing had no influence on water coliform counts. Other investigations are available showing livestock grazing did not cause harmful levels of coliform bacteria (Kunkle 1970; Kunkle and Mieman 1967, 1968; Stuart et al. 1971).

Controlled livestock grazing may be an effective tool for increasing water yields from public lands in certain locations. Studies are available showing greater water yields on grazed compared to ungrazed areas (Liacos 1962, Hanson et al. 1970, Lusby 1970). Data from these investigations showed that light or moderate grazing could be used to increased water yield without damage to soil or vegetation.

### **Wildlife Impacts**

In recent years there has been a growing interest in the impact of controlled livestock grazing on wildlife. The response of wildlife to livestock grazing has varied with the species in question and how the grazing was conducted. It does appear that grazing is not detrimental and may actually be beneficial to many important wildlife species when carefully controlled.

Big game numbers on public rangelands have substantially

increased in the last 60 years (Council for Agricultural Science and Technology 1974, Wildlife Management Institute Staff 1978). Some of this increase can be attributed to controlled grazing and range improvement projects which have resulted in the landscape supporting many stages of ecosystem development (Council for Agricultural Science and Technology 1974, Wolfe 1978).

Livestock grazing impact on big game animals depends primarily upon the degree of overlap in diets between a given big game species and domestic herbivores. Moderate or light livestock grazing on rangelands has usually resulted in little competition with big game animals (Skovlin et al. 1963, McKean and Bartman 1971, Hansen and Reid 1975, Yoakum 1975, Miller and Krueger 1976, Currie et al. 1977, Stuth and Winward 1977). Livestock can be used as a tool to manipulate vegetation for big game animals. Jensen et al. (1972) reported that spring grazing of sheep on deer winter range was effective in providing more browse by retarding competition from herbaceous growth. Anderson and Scherzinger (1975) reported that light cattle grazing actually improved the palatability of forage for elk on winter ranges. Moderate cattle grazing in British Columbia made spring forage more attractive to deer by removing mature forage (Wilms et al. 1979).

Ground nesting birds are probably more severely affected by overgrazing than any other group of wildlife. It is well known and accepted that gallinaceous gamebirds are intolerant of heavy grazing during the nesting season. However, many of these same birds are dependent on shrubs, annual grasses and forbs associated with early successional stages for food (Yocum 1943, Edminster 1954, Schemnitz 1961, Hungerford 1962, Christensen 1970, Davis et al. 1975). Therefore controlled grazing has considerable value as a tool to provide a variety of habitats in different successional stages. In New Mexico, Campbell et al. (1973) believed that moderate grazing could be beneficial to scaled quail by providing more food choices of forbs and shrubs than ungrazed grasslands. In Texas the endangered Attwater prairie chicken concentrated on grazed pastures and avoided ungrazed pastures (Kessler and Dodd 1978). It was reported that livestock grazing maintains the structural characteristics of grasslands needed by the Attwater prairie chicken for escape, nesting and feeding. These findings were consistent with other investigators' who reported prairie chickens avoided thick, matted, ungrazed cover (Lehman 1941, Grange 1948). Evidence is available that moderate grazing of prairie potholes provides more suitable habitat for nesting ducks (Bennet 1938, Kaiser et al. 1979). At the Ladd Marsh and Summer Lake waterfowl management areas in Oregon, livestock grazing is being used to control vegetation and provide a mixture of plant communities needed by waterfowl.

### **Economic Impacts**

Two arguments used by those opposed to livestock grazing on public lands are that livestock producers are subsidized by low grazing fees and that tax payers and other ranchers not using public land subsidize those ranchers using public lands by providing roads, fences, seedings, water systems, and other benefits. The first argument, that livestock producers are subsidized by low grazing fees, is only partially correct. Grazing fees on public lands are much lower than those on private lands. However, there are problems associated with grazing public land that are often overlooked. Most of these problems relate to management. On public lands the government agency dictates livestock management rather than the rancher. Grazing periods and stocking rates are based on the average time of range readiness and forage production rather than on forage availability and nutritive value during individual years. This often results in poor efficiency in the use of the forage resource. The rancher on public ranges has little flexibility in the type and class of animal that he may graze on a given range. Further livestock management programs by government agencies often place indirect restrictions on how the rancher will use his labor resources during critical periods of the year. Most ranchers in the Northwest and some ranchers in the Southwest share the same allotments with other ranchers. This makes it difficult for a rancher

to upgrade his herd with superior bulls. Supplementation and early weaning programs are virtually impossible on common allotments. The rancher grazing on a common allotment must depend on cooperation from other ranchers using the allotment in order to move cattle at the right time and insure fence maintenance. When these disadvantages are all added, grazing on public lands is not as lucrative as it may appear.

In regard to the tax payers' subsidization of range improvement projects, this is only partially correct. Fences, water developments, trails and other improvements on public rangeland often come out of the rancher's pocketbook. Range reseeding projects, in many cases, involve monetary and labor inputs by ranchers as well as government agencies. These improvements all indirectly increase the price of an animal unit month to the rancher using public land. Improvements such as water development often enhance wildlife habitat and sometimes aesthetic values.

The Council for Agricultural Science and Technology (1974) reported that in many areas of the West local ranchers are highly dependent on public rangeland in order to stay in business, because government agencies own practically all the land except for the rancher's base property. This is particularly true in the states of Oregon, Idaho, Nevada, Wyoming, Utah, Arizona, and New Mexico, where over 50% of the land is in public ownership. Many local economies in these states would be severely damaged if grazing was terminated on public lands. Taxes derived from ranchers using public lands have provided for needed roads, dams, schools, and other public works. These ranchers generate many jobs and much income for their activities in other segments of society. Also, they contribute a way of life and type of person that is important to American culture.

### Conclusion

In conclusion, it must be emphasized that forage is the primary crop produced by public rangelands in the western United States. Range forage is high in cellulosic material that cannot be used directly by humans. However, forage consuming animals such as cattle, sheep, and goats can be used to convert the large supplies of cellulosic material produced by rangelands into red meat, which can be used by man. Livestock grazing controlled by the use of scientific principles is compatible with other public rangeland resources, such as water and wildlife, and may be used for the enhancement of these resources. In the future, it is expected that grain for livestock feed and fossil fuels will be in short supply. This is coupled with the fact that the world's population is expected to double in the next 75 years while at the same time the land base for producing food is shrinking. Under these circumstances it seems essential that we rapidly develop our public lands so they will support larger numbers of livestock instead of eliminating livestock grazing from these lands.

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