

EFFECTS OF LIVESTOCK GRAZING ON WILDLIFE

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ABSTRACT.

It has long been a tenet of wildlife management that, on properly managed ranges, livestock presents no problems for wildlife. A corollary of this belief has it that livestock grazing is actually beneficial to wildlife. I personally must have been thoroughly indoctrinated with these "facts" when I was getting a degree in wildlife many years ago. Certainly I never seriously questioned them for a long time afterwards despite personal observations that should have given me pause. There is, of course, a kernel of truth in these ideas. Unfortunately what is generally ignored is that qualifier "...on properly managed ranges." Also ignored is the fact that the species of wildlife occasionally favored by grazing are seldom as desirable as those that are displaced.

In reality, despite such a long cherished and widely held belief that all is well between livestock and wildlife, the grazing of domestic livestock on western rangelands has probably had a greater adverse impact on wildlife populations than any other single factor. The impacts are particularly severe on the deserts of the Southwest.

Curiously it is only in recent years that agencies and organizations concerned with wildlife have begun to address this problem. This now seems to be changing, probably because of accumulating evidence that the impacts of range abuse by livestock are usually disastrous for wildlife. During the past few years study after study has demonstrated that grazing depresses virtually all species of wildlife. The reason is that the problem is not grazing as such. The damage to wildlife populations is a result of grazing having been carried to extremes. In short, the problem is overgrazing, not grazing *per se*.

To appreciate fully the impact of excessive grazing on wildlife, we have to consider the effect of range abuse on two of the three critical needs of wildlife -- food and water. Popular belief notwithstanding, many species of wildlife, including a variety of rodents, reptiles, some carnivores, and even some birds, can thrive in the absence of free water, generally considered to be even more important than food and cover. No species, however, can survive for long without both food and cover.

Heavy grazing by domestic livestock reduces the quality and the quantity of both food and cover and in doing so reduces the ability of the area to support wildlife. On occasion, some species may temporarily find the impoverished habitat of an overgrazed area more to its liking than an ungrazed, or lightly grazed, area. Such species as may be favored by overgrazing are rarely as interesting and important to man as those that have been eliminated. Who would willingly swap herds of antelope and bighorns for an infestation of rodents and jackrabbits?

I suspect that the recent history of mule deer populations in the West is largely responsible for the belief that grazing, even overgrazing, is beneficial to wildlife. At the risk of boring most of you who are familiar with it I'd like to sum up this history in a few words. Briefly, it goes like this:

When the white man came on the western scene a couple of hundred years ago, mule deer were scarce. The lush range conditions that existed prior to the large scale introduction

of livestock in the mid-1800's constituted relatively poor habitat for deer - too much grass and not enough shrubs. The heavy grazing by livestock which began some 100 years ago reduced the grass cover and promoted an increase in shrubs, thereby improving conditions for deer. The increase in deer in the first half of this century is generally attributed to the improved deer habitat created by such overgrazing.

Undoubtedly overgrazing played a part in the increase in deer of the past half century or so. But, as Salwasser (1976), in an excellent discussion of probable causes of deer eruptions and declines, points out, there were other factors besides livestock grazing that contributed, and may have been even more important in the development of the peak deer herds of recent vintage, including fire and logging.

Certainly, if deer ever benefitted from overgrazing, the beneficial effects were relatively shortlived. In Arizona, at least, range conditions today are generally so bad there is severe competition between cattle and deer for all forage. On many ranges perennial grasses are either scarce or absent entirely and cattle feed heavily on browse plants wherever they occur. Unfortunately, the relationship of grazing intensity to deer numbers has not been the subject of much research. A couple of recent studies of the U.S. Forest Service in Arizona, however, have produced some interesting data.

On the Tonto National Forest, counts of cattle droppings and of deer pellet groups were made on 3,400 plots by Forest Service personnel. They found an inverse relationship between deer use and cattle use. Deer use varied from none at all (no pellet groups) on areas which had 500 to 900 cattle droppings per acre, to a high of 160 deer pellet groups per acre where cow droppings were down to less than 11/acre (Tonto National Forest, unpublished data).

A comparable inverse relationship between deer and cattle use was observed on the Apache-Sitgreaves National Forest. Here the comparison was between deer pellet groups and percent utilization of the forage resource. On an area not grazed by livestock, 103 deer pellet groups per acre were tallied. Pellet groups declined to a low of 27 per acre on areas where more than 55 percent utilization occurred (Apache-Sitgreaves National Forest, unpublished data).

Two Environmental Impact Statements prepared by the BLM in Arizona during the past year both attributed low deer numbers to the generally overgrazed condition of the areas in question.

While you might want to argue about the statistical merits of such data, what can't be ignored is that there are no data that I'm aware of that suggests that deer might actually benefit from overgrazing.

What about other species?

Several studies throughout the West have demonstrated that elk and cattle are something less than compatible. Mackie (1970) in Montana and Skovlin, et al. (1968) in Oregon have reported that elk use on their study areas was inversely related to cattle use. When cattle moved in the elk moved out. Arizona Game and Fish studies near Flagstaff yielded similar results. One watershed was heavily used by elk from the time it was treated and fenced to exclude livestock until some 5 years later when cattle were again permitted to graze the area. Since then evidence of elk has been conspicuous by its absence (Neff 1972).

Incidentally, hunters of my acquaintance in Arizona are putting this knowledge to good use. An important part of their planning is determining which allotments in their hunt unit were rested in the months immediately preceding the hunt and which were grazed. They do their hunting on the rested parts of the unit.

It is generally acknowledged that the decline of bighorn sheep in the West was the result largely of overgrazing and diseases introduced by livestock. Here too, however, there have been few attempts to investigate the more recent relationships between livestock and bighorn sheep, particularly in the Southwest. Still, what few data are available are significant. In Utah, Wilson (1975) reported that there had been no bighorns sighted in Red Canyon in the southern part of the state since 1887 -- the year cattle were introduced.

The cattle were removed in 1974 and within 6 months the bighorns were again using the area. In another canyon where bighorns were well established, 30 heifers were introduced as an experiment. Even though the cattle were removed within a month, no bighorns were seen in the canyon for another 8 months.

In Nevada, McQuivey (1978) in a recently completed study reported that desert bighorn population density was twice as high on ungrazed areas as on areas grazed by livestock.

When we also consider that the best desert bighorn populations in New Mexico, California and Arizona are in areas not grazed by livestock, the probability that even today livestock may still constitute the most serious limiting factor for bighorn sheep, can scarcely be ignored.

The term "wildlife" in the context of any discussion of livestock-wildlife relationships generally brings to mind one of the large game animals. The impacts of grazing, however, are not limited to large mammals. Birds of various species are also affected.

A study near Williams, Arizona found a significant difference in turkey poult survival between heavily grazed and ungrazed areas -- 580 poults per 100 hens on the ungrazed compared to 150 poults per 100 hens on the grazed (Phillips 1975). A reduction in nesting cover on the grazed areas, coupled with increased exposure of poults to predation, is believed to be the explanation.

As long ago as 1934, Gorsuch (1934) remarked on the impact of livestock on Gambel quail populations. Somewhat later Wallmo (1956) reported on the deleterious effects of grazing on the food and cover needs of scaled quail in Texas. In his recently published monograph on the valley quail, Leopold (1977) blamed overgrazing for the marked reduction in valley quail populations which has occurred over much of California during the past 75 years or so.

The Arizona Game and Fish Department recently concluded a 9 year study of Mearns quail which demonstrated that overgrazing of its oak-woodland habitat had devastating consequences for this species (Brown, in press). The most heavily grazed areas were totally devoid of Mearns quail. Interestingly, this study also revealed that grazing promoted an increase in the key forage plants for this quail. Here is a case where cover is definitely more important than food. Without tall perennial grass cover the bird cannot survive -- despite an abundance of food.

Non-game forms also suffer from overgrazing.

Several studies have shown an inverse relationship between overgrazing and small bird populations. Buttery and Shields (1975) reviewed a series of papers which showed that bird populations generally declined in the presence of heavy grazing by livestock.

Some investigators have reported an increase in rodents and lagomorphs as a result of range abuse. In this context Wagner (1978) suggests that "...range degradation for one (species) may be range improvement for another." The work of other researchers, however, suggests that even benefits to such unappreciated forms as rodents and rabbits are probably shortlived. When range abuse is continued for decades, as it has in much of the Southwest, the inevitably severe soil erosion reduces the quality of the habitat for even kangaroo rats and jackrabbits. A study in southern Idaho found rodent burrows significantly higher on ungrazed pastures than on grazed ones (Anderson 1972). In a seldom grazed holding pasture on the Apache-Sitgreaves National Forest in Arizona the total rodent population was found to be roughly twice as high as on the heavily grazed portion of the allotment (unpublished data in files of Apache-Sitgreaves National Forest). Carothers et al. (1976) in a study on the impact of burros on a desert region in the Grand Canyon found both a greater diversity of small mammals as well as higher total numbers on an area devoid of burros compared to an adjacent one heavily grazed by them.

Cold blooded forms have also been demonstrated to be adversely impacted by range abuse. A recent symposium in Denver, Colorado included several illustrated presentations which showed graphically the undesirable consequences of overgrazing on stream ecosystems. One study found a 570 percent increase in trout numbers in one stretch of stream 5 years after cattle were fenced out compared to the adjacent ungrazed area (Duff 1978).

Finally, several recent studies have shown that cattle even impact on populations of reptiles. In southern California, Busack and Bury (1974) reported that lizard populations were reduced by heavy grazing and ORV use. At the North American Conference last March, Kirstin Berry reported on various adverse impacts of grazing on desert tortoise populations (Berry 1978).

While many of the investigations may not have produced statistically conclusive results, there is one significant feature common to nearly all studies of grazing impacts on wildlife: Almost without exception, the data indicate that excessive grazing or overgrazing has adverse effects on most forms of wildlife. There are no studies that have demonstrated that protracted range abuse favors any of the species that man normally considers interesting or valuable.

Since there is clearly strong evidence that wildlife is unfavorably affected by overgrazing, and since by the admission of the major land management agencies (Gallizioli 1976) the condition of our public lands indicates that overgrazing continues to be the rule rather than the exception, it would seem to follow that the much touted principle of multiple-use must be more preached than practiced. There have recently been some encouraging signs in my home state of Arizona that the BLM and the USFS both are making an effort to correct some of the worst instances of range abuse. The scope of the problem is of such colossal proportions, however, that there is not as yet much cause for optimism that our degraded rangelands will be restored to their potential productivity within a reasonable length of time.

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