

Livestock to Wildlife is not a Simple Conversion

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The concept of multiple use on federal lands was established through such Congressional Acts as the Taylor Grazing Act of 1934, the Classification and Multiple Use Act of 1964 and the Federal Land Policy and Management Act of 1976 (FLPMA). This last act explicitly states that public lands are to be managed to, among other things, "...provide food and habitat for fish and wildlife and domestic animals;" (Ross 1984). The simplicity with which multiple use goals are expressed, though, often becomes antithetical at the implementation level.

The appropriate multiple use balance between wildlife and livestock has been disputed for several decades. Increasing wildlife numbers has been used to justify reduction and removal of livestock from public ranges. Comparing just the weight conversion factors for animal unit months (AUMs), indicates that removal of livestock from public lands could amount to a tremendous increase in wildlife numbers. For example, 8.3 pronghorn antelope, 6.6 mule deer, or 1.4 elk could graze on the same forage consumed by 1 mature cow or 6.6 sheep (Holechek 1988).

Concern has been expressed about properly maximizing the sum of all multiple use values on public lands. Loomis et al. (1989) stated the "economically efficient use of these public rangelands requires adjusting the mix of livestock and wildlife such that the mixture is roughly proportional to the relative values these different animals provide". Attempts have been made to estimate market value of wildlife using the travel cost method (TCM), contingent valuation method (CVM), gross expenditures method (GEM) and others, in hopes of determining an economically optimum tradeoff between livestock and wildlife (Decker and Goff 1987, Loomis et al. 1989).

An exacting AUM conversion or marginal value approach may be valid in some areas, but for the majority of intermingled public/private land areas of the west, these direct conversions are only part of the rationality required to determine the trade-off between livestock and wildlife. While this article focuses on issues most germane to Wyoming, it should be applicable to public land states throughout the west.

How Wildlife Population Objectives are Established

Wildlife have been declared to be held in trust by each

state. State Game and Fish agencies were established to regulate and control wildlife populations. Svoboda (1980) wrote that states can effectively regulate how wildlife populations are utilized, but they are less effective at directly controlling production of wildlife.

Big game population objectives are determined in Wyoming by the Wyoming Game and Fish Department. Population objectives are both habitat and politically dependent. At least every five years the Game and Fish Department evaluates and updates its long-range strategic plan which includes population objectives for each of the six species (antelope, bighorn sheep, deer, elk, moose and mountain goat) defined by Wyoming Statute as "big game". Each of the six species is broken into herd units based on the home range of a group of animals. The population objective for a particular herd unit represents the desired number of animals in the unit for the winter season. Public hearings are held to obtain input concerning the intended population objectives. Following the hearings, a population objective for each herd unit is set and sent to the Wyoming Game and Fish Commission (an appointed governing body) for review and approval. The Game and Fish Department then manages herds to attain or maintain population objectives, including updating objectives annually as conditions warrant.

Several factors are considered when setting target population numbers. These factors include (1) the support of the natural habitat, (2) hunting access, and (3) landowner tolerance of wildlife on private land.

Support of the Natural Habitat

The Forest Service allocates forage for wildlife in its forest management plans. Bureau of Land Management resource area plans typically limit wildlife to existing use of forage beyond that needed for designated livestock use. Wildlife use of state lands is recognized as a legitimate use but none of the western states set aside or reserve forage expressly for wildlife.

Although state wildlife and federal land management biologists and planners consult with one another, their management plans are not necessarily integrated. Thus, the population objectives set by the Game and Fish Commission may be independent of the management plans adopted by the federal agencies. Thomas (1984) identified the separation of wildlife regulatory authority from habitat ownership as the center of most wildlife management problems.

One of the considerations in Federal land management plans is the competition that exists between multiple users.

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Competition between wildlife and livestock on public lands has centered on food, space and social interactions (Holechek 1980). These factors can create a competitive relationship where one user of public forage must be reduced to allow for the other user. This competitive relationship is not a one-to-one or pound-for-pound relationship as is suggested by AUM conversion ratios. The degree of dietary, space and social competition varies greatly. Within certain limits, a supplementary relationship can exist where increases in one big game species can occur without a decrease in livestock numbers and vice versa. This relationship exists when livestock and wildlife utilize different areas or forage types. In general, though, there appears to be a high dietary overlap between cattle and elk (Nelson 1982), while antelope and mule deer can coexist more successfully with cattle than with sheep (Schwartz et al. 1977). Social interactions also appear to play a significant role between elk and cattle and between cattle and mule deer, especially in elk calving and doe fawning areas (Nelson 1982).

Complementary relationships have also been identified between cattle and some species of big game in limited instances (Nelson 1982). Allowing a moderate amount of grazing by cattle (big game) on big game (cattle) ranges can improve the range for big game (cattle). The complementary relationship results from the forage preferences of the different species. The undesirable, unpalatable vegetation for one class of animals growing unchecked may crowd-out more desirable vegetation. Introduction of another class of grazing animals with preference or tolerance for the vegetation considered undesirable by the primary animal class can serve to check the growth of that vegetation and actually improve the range.

While the Forest Service and Bureau of Land Management are directed by the multiple use mandate to allocate available forage during seasons when wildlife and livestock utilize lands under their jurisdiction, big game management agencies must be concerned with the forage and habitat requirements of big game year round. Land ownership patterns often change from predominantly public to primarily private ownership for many big game animals as they migrate from summer and winter use areas. It is winter habitat, generally, that is subject to industrial, municipal and residential development pressures. The conversion of domestic livestock AUMs into wildlife AUMs on the Forest Service summer range, for example, may be an academic exercise in many instances unless there is adequate winter range available for the wildlife.

Access to Hunting

Hunting is the fundamental activity used to manage big game populations. When game populations are below objectives, the number of hunting licenses authorized in a particular area can be reduced, seasons may be shortened and/or hunting may be restricted to mature males. When populations are above objectives or forage conditions are depressed, license numbers can be increased, special

female/juvenile permits can be issued and season restrictions made more liberal.

For hunting to be a successful management tool, hunter access must allow the desired harvest. Although wildlife are publicly owned, much of the land wildlife utilize is privately owned. This is particularly true of pronghorn and deer. Landowners are entitled to hunt game animals on their property subject to state regulations, to charge for access, to lease their land to others for hunting, or deny hunting access.

In areas where private and public lands are intermingled, private lands can effectively block access to public lands. Although access to the blocked lands sometimes can be legally obtained, it is usually costly, both monetarily and politically (Davis et al. 1987). Private landowners close their lands for many reasons including damage to roads, fences and other facilities, gates left open, spread of noxious weeds, vandalism, livestock losses and susceptibility to liability claims (Thomas 1984, Lacey et al. 1993).

To compensate landowners, in part, for the costs and inconveniences associated with big game and to encourage landowners to keep land open to public hunting, the Wyoming Game and Fish Department attaches a landowner coupon to each elk, deer and antelope license. The coupons carry a redemption value of \$9.00 when presented by a private landowner. When a game animal is taken on private land, the hunter is expected to sign, date and transfer the coupon to the landowner. When landowners present coupons for payment, they must sign an affidavit that the animals, represented by the coupons, were killed on their property.

Private lands are being closed to hunting by an increasing number of landowners who consider hunting as a sport to be morally wrong (Wright and Fletcher 1987). Although antihunting sentiments have closed only a small percentage of the total private land to hunting, it is likely that the percentage is increasing considering the growing antihunting trend among the general public. Kellert (1978) found during the 1970's that at least half of all U.S. residents were opposed to hunting. The growing sentiment toward wildlife protectionism has been augmented by the "increasing loss of human ties to the land and its products, and encouragement by some entertainers, other publics, and the popular media to escape from reality through animation and anthropomorphism" (Weigand 1992).

While management and control of game by wildlife management agencies is thwarted by lands closed by landowners, private lands leased for hunting purposes can also act as an obstacle to game management. The bylaws for many clubs call for bag limits that differ from those the game management agency has implemented. The orientation of hunting clubs to trophy harvest can result in disproportionately high post-season numbers of female and younger aged animals that cause winter damage to neighboring farms and ranches (Nielsen and McBride 1989). Outfitter control of hunting on private lands can cause imbalances in sex/age ratios as they tend to select trophy class animals.

The economic opportunities related to hunting realized by one landowner can create big game problems for other landowners. These situations can cause agencies to adopt management plans intended to lighten the burden on landowners *inadvertently harmed by too many wildlife* rather than management plans better suited to the general or hunting public.

Public Tolerance of Wildlife

Craven et al. (1992) suggests that tolerance, not habitat, may be the limiting factor that imposes population bounds on big game. Public tolerance of wildlife damage is especially low in many public land states because federal lands act as reservoirs from which big game move to feed upon private resources in many areas (Davis et al. 1987). In a survey of southwestern Montana landowners, Lacey et al. (1993) estimated that big game consumed an average of 511 AUMs per landowner at a cost of \$5,616. They further state that while many landowners are willing to tolerate some damage to gain the aesthetic and recreational benefits big game provide, or because they feel a moral obligation as stewards of the land, tolerance levels quickly diminish as the landowners' economic dependence on the land increases.

Landowners not allowing access to hunters can also aggravate the tolerance issue, especially if wildlife are on "no access" property during the hunting season and are on "access" property during other seasons. Another issue that often diminishes landowner tolerance of wildlife is when AUMs for livestock are decreased on public land, but wildlife depredation on the private land continues. The argument has been made that many ranchers and farmers will not provide as much winter feed for big game if their AUMs on public land are cut since they will have to utilize their private forage more intensively.

In Wyoming, as in several other states, the state wildlife agency is authorized to compensate individuals for damage caused by big or trophy game animals and birds (Wyoming Statutes, 23-1-901). Wyoming's game damage law prohibits the Department from considering claims from landowners that do not permit hunting during the established season. The damage law also stipulates that landowners must notify the Department promptly when game damage is occurring on their lands and that damage claims must be filled "no later than sixty (60) days after the damage or last item of damage" (Wyoming Statutes, 23-1-901). Preliminary results from a survey the authors are conducting suggest that many landowners do not submit damage claims because they feel the claim process is too restrictive or inconvenient. The Wyoming Game and Fish Department also provides materials to protect stored crops from damage by big game and engages in other damage prevention activities. Some severe conflicts have been resolved through land purchases for the purpose of providing winter forage for big game.

Conclusions

Multiple use goals on public lands often have implications that reach beyond federal land boundaries. Divergent ownership of resources that sustain wildlife along with the varied public interests in wildlife have created numerous management problems. Increasing wildlife numbers is not just a matter of exchanging livestock AUMs for wildlife AUMs on public rangelands. Support of the natural habitat, an effective population control mechanism such as uniform hunting, and staying within reasonable damage limits, often are more constraining than the amount of forage available on public lands.

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