does supplement public rangeland dollars. BLM permittees have contributed significantly to range improvement on the public domain.

Summary and Conclusion

If the purpose of the NRDC-NWF report is to conclusively establish the "ailing" status of our public rangelands, it has failed. The report is an oversimplified compilation of tentative, dated, and technically diverse measurements of range ecological condition. These measurements, by themselves or as interpreted by NRDC-NWF, provide no scientific documentation of the health and prognosis of BLM administered lands. The report's disregard for range trend and its failure to elucidate the biologic, ecologic, and economic dimensions of ecological range condition erodes its credibility and legitimacy as a serious commentary on the condition of public domain rangelands.

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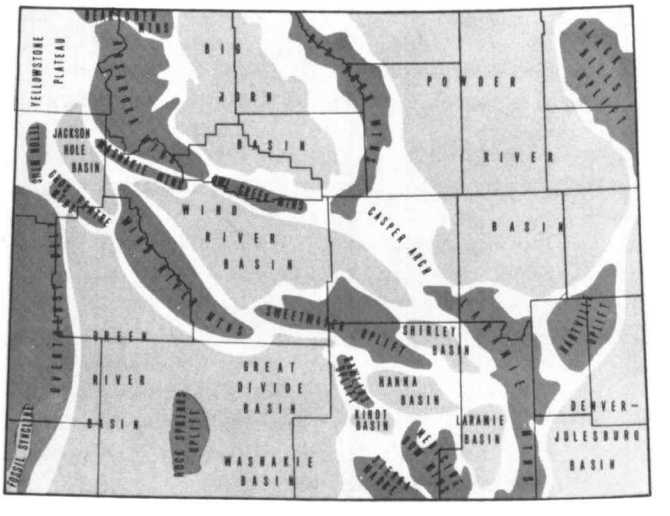
Questions about Livestock-Big Game Relations

Jeff Powell, Grant Godbolt, and Wm. G. Hepworth

Forage quantity and quality are not the only factors limiting big game carrying capacity of the Bighorn Mountains of Wyoming but they are major factors limiting livestock carrying capacity. Ranchers are dependent upon the Bighorn Mountains for livestock summer grazing and maximum livestock gains in a relatively short period of time. Big game also depend on the Bighorns for spring and summer grazing and to a considerable degree the lower areas for winter ranges. Therefore, if total animal output is to be maximized, the negative aspects of competition must be determined and minimized while all opportunities to increase both livestock and big game are explored.

In this paper we would like to ask questions because the situation in the Bighorns is not unlike the situation in many parts of the Rocky Mountains. The literature concerning livestock-big game relations has many answers, but these answers do not fit our questions. Therefore, we will appreciate a response from anyone who has the answers.

The Bighorn Mountains of north-central Wyoming are bordered on the east by the Powder River Basin and on the west by the Bighorn River Basin . On the north are the Pryor Mountains and the Bighorn Canyon of Montana. To the southwest lie the Owl Creek Mountains.



Location of the Bighorn Mountains in Wyoming.

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Grasslands in the Bighorn Mountains of Wyoming.

Sheep and beef cattle are the most common livestock animals grazing the Bighorns. Elk, mule deer, and moose are the most common big game animals. Most migratory animals move higher into the mountains in the spring as the snowline recedes and move down to lower elevations as winter snows cover the forage. Big game animals migrate naturally. Livestock migrate at the will of the owners and public land managers—except when early September snows send the cows home before anyone knows they are coming.

Generally big game move higher into the mountains very soon after the snowline recedes. This is particularly true of elk. At this time, forage is succulent, flies and heat are less objectionable than at lower elevations, and habit motivates big game to follow closely behind the receding snowline.

Through years of study and experience, rangeland managers have developed a concept of "range readiness" for different range sites. Range readiness has usually been associated with grazing by livestock, primarily because the decision of when to "turn-on" implies control of the location of livestock. Distribution of big game in the Bighorns on any given date is much more dependent on weather and numerous other factors than on the judgement of land managers or wildlife biologists.

In effect, big game often graze areas before the sites are "ready" to be grazed. In spring, big game animals concentrate on succulent forbs and grasses. Reproducing females depend on the succulent vegetation associated with cover. During dry years and in the open parks this is most available in drainageways and riparian areas—those areas also preferred by livestock.

Big game usually move into, graze, and move out of an area rather rapidly depending on the rate of snowline movement. During some years, or in certain areas, big game remain in an area for longer periods of time for calving or because of abundant forage in the area. Therefore the length of time mule deer and elk remain in any location has an influence on the degree of grazing and local forage.

The effect of spring grazing by big game, especially elk, also depends on the grazing pressure at a particular time. If growing conditions are poor because of cold and/or dry weather and there is a large number of animals in that area, grazing pressure can be relatively high. When growing conditions are good and the number of animals is small, grazing pressure is low and the effect is minimal—or is it?

Because big game commonly move into an area before livestock are permitted to graze that area, ranchers are concerned that spring big game grazing may reduce the amount of forage available for summer livestock grazing. Research in other similar regions indicates certain species of plants are capable of continuing leaf growth or growing new leaves after being grazed, even in a short growing season. The capacity for regrowth of each species depends on many factors, such as degree of defoliation, growing conditions and period of rest after initial defoliation. Question: how well can results from grazing studies in other regions be extrapolated to ecological conditions in the Bighorns?

Are the plants grazed by big game in spring significantly different from those preferred by livestock in summer? If they are, the question of regrowth may be a moot point. Most diet studies indicate a significant dietary overlap between elk and cattle and between mule deer and sheep and somewhat less between elk and sheep or between cattle and mule deer.

The only problem with these studies is most researchers were still waiting for roads to become passable while elk and deer were happily munching on new green growth in snow-free areas. What is spring to big game is much earlier than spring to a graduate student who has not yet taken his or her spring term finals.

If plants grazed by big game in spring are also regrazed by livestock in summer, the concern about regrowth may be valid. In this case, the degree of spring defoliation, period of rest, and growing conditions during rest before summer grazing, will have a significant impact on plant vigor, summer forage production, and ultimately, range condition and long-term carrying capacity. At what intensity and duration of early spring grazing does range productivity and condition decline? Is it possible that some early spring grazing may actually increase range productivity and condition?

Elk in the Bighorn Mountains of Wyoming.

What is the effect of big game remaining in an area with no rest period before summer grazing by livestock? Forage quality in the Bighorns declines rapidly with advancing plant maturity. Therefore the longer livestock are prevented from grazing an area, the lower the forage quality and the lower the livestock gains. Delaying livestock turn-on date may help forage plants, but not livestock gains or rancher income. Grazing too early could mean insufficient forage, hungry livestock, and cattle losses because of larkspur.

Delaying turn-on to higher elevation Bighorn ranges also means increasing the period of time livestock graze the lower elevation ranges. Some of these are critical winter ranges for big game. Livestock spring range is primrily BLM land on the west side of the Bighorn National Forest, but primarily private land on the east side. Will the BLM appreciate longer grazing periods on BLM land to delay turn-on onto the national forest? Will this use ultimately cause an adverse effect on those lower ranges for big game? Late spring grazing of big game winter ranges by livestock could reduce their carrying capacity for elk but increase it for mule deer if browse increases.

Numerous studies have attempted to determine why elk graze where they graze. Some studies indicate certain areas are more likely to be grazed each year by elk in spring than others, but the location of spring elk grazing and degree of grazing pressure are highly variable. What is the effect of big game grazing pressure one spring and then light spring grazing pressure the next one or two years?

Topography and cover are physical factors influencing grazing behavior. Weather is indeed an influencial factor, but higher variable and unpredictable. The Influence of "social" factors, such as the presence of people or livestock, is still being debated and studied by scientists. Can anyone predict, with any assurance, where elk will graze in the early spring?

There are other questions that still need to be considered. Is the existing vegetation most suitable for the kinds of range animals currently using the forage? What is the maximum carrying capacity for the mix of range animals currently using the range? Were grazing pressures and seasons of the elk, deer, bison and sheep use in pristine times the same as grazing pressures and seasons of the elk, deer, cattle and domestic sheep use of today? What is the best mix of range animals to maintain "optimum" range condition—whatever that is?

Range sites dominated by Idaho fescue are the most common forage producing areas in the Bighorns today. If the Idaho fescue plant community evolved under both spring and summer grazing, that plant community should be resistant to both spring and summer grazing today. Research shows that Idaho fescue is resistant to grazing after about early or mid July. Therefore, "moderate" summer-grazing-only is not an issue, but how much spring grazing is also "moderate" and does spring grazing with or without rest reduce the resistance of the plant community to summer grazing are significant issues.

If the plant community can not withstand current levels of spring and summer grazing pressure, one alternative may be to decrease spring grazing pressure by increasing spring forage supply. Spring forage supply can be increased and species composition changed by practices such as brush management, fertilization, seeding introduced species, and clearcutting timber. These practices may not be economical when balanced against only increases in livestock products. However, the benefit:cost ratio would be much more favorable if these management practices increased big game numbers, reduced soil erosion, and improved fisheries habitat and these values were included as benefits.

There is a finite limit to the number of animals that a range can carry without causing soil erosion, a loss of animal performance, and wildlife population crashes during droughts and hard winters. This maximum number of animals is usually, but not always, greatest with a mix of different kinds of animals. What is the optimum mix?