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WILD AND FREE-ROAMING HORSES AND BURROS

Final Report of the
Committee on Wild and Free-Roaming Horses and Burros
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IMPORTANT MANAGEMENT CONSIDERATIONS

What Is Excess?

Excess Defined

The Congress repeatedly used the term "excess" in the Public Rangelands Improvement Act in relation to wild horses and burros. In Sec. 14(a) of the Act, it authorized the research study reported herein which was intended to assist the Secretaries of Interior and Agriculture in determining what constitutes excess. Given only this charge, the Committee could have outlined an array of management options ranging from multiple-use programs designed to accommodate livestock, native wildlife, and wild equids, to single-use areas set aside for equids; and from the maintenance of low-equid densities which competed minimally with domestic and wild ruminants, to high-density equid populations developed for maximum viewing and with little consideration for the effects on other ecosystem components. What constitutes excess, then, could take a number of forms relative to these alternatives.

However, the Act proceeds in Sec. 14(b) itself to define "excess animals" and thereby focus the Committee's attention on a limited portion of the array: " . . . wild free-roaming horses or burros . . . which must be removed from an area in order to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area." These references are clearly part of the broader concern in PRIA for the condition and improvement of the public rangelands:

> Sec. 2. (a) The Congress finds and declares that --
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> (1) vast segments of the public rangelands are producing less than their potential for livestock, wildlife habitat, recreation, forage, and water and soil conservation benefits and for that reason are in an unsatisfactory condition; . . .
>
> (b) The Congress therefore hereby establishes and reaffirms a national policy and commitment to: . . .
>
> (2) manage, maintain and improve the condition of the public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process established pursuant to section 202 of the Federal Land Policy and Management Act (43 U.S.C. 1712). . .

For these reasons, the Committee has taken the intent of PRIA as its basis for considering the concept of excess, and this appears to contain two basic elements:

1. A concern for the condition of range resources approaching maximum or potential productivity
2. A concern for multiple-use management and a plurality of resources (livestock forage, wildlife, water, soils, and recreation, as well as wild equids)

Consequently, it has tried to focus the concept of excess within the context of these two tenets. But before considering some of the specific criteria for management programs that avoid excess, it seems desirable to analyze the concept in the abstract.

For each site, or tract of land, there is some vegetation potential in terms of the kinds and amounts of plant species. In theory, one could perhaps think of such a potential uninfluenced by herbivorous animals, and determined by climate, soil, and topography, and by competition between the plant species themselves. Of course, in reality no site is free of all herbivores, whether they are insects, small mammals, large grazers, or others.

The effects of these animals on the vegetation vary in kind and degree. Some actually enhance the performance of individual plants by grazing if it is not excessive. Thus McNaughton (1976) has emphasized the enhancement of vegetative production by moderate, large-ungulate grazing in African grasslands, an effect that has been observed in North America in relatively mesic grassland situations.

Consequently, herbivores in a sense can enhance the potential of some areas. But some grazing reduces plant production. Such is the case with excessive grazing, even in productive grasslands, and appears to be the case with virtually any level of defoliation in semiarid and arid regions (Cook, 1971; Sims and Singh, 1978; Hilbert et al., 1981; Lacey and Van Poolen, 1981).

These effects on individual plants ultimately affect the composition of plant communities, and in various ways. Plants of the different species in a community compete among themselves for space, water, light, and mineral nutrients. In free competition, without interference from other organisms, a community will gradually shift to a predominance of those plant species that are the most effective competitors.

In those cases where herbivory is detrimental to individual plants, the competitive balance between plant species can be altered. Grazing on the less competitive species will tend to hasten the dominance of the superior competitors and reduce community diversity. But grazing on the more effective competitors can impair their competitive ability, reduce their abundance, and facilitate the coexistence of the less aggressive species. The result is to increase the species diversity of the community.

Because herbivores produce these effects on the vegetation on which they depend, they ultimately affect themselves and each other in various ways. An herbivorous species that increases grassland

production through moderate grazing can improve its own lot and that of other herbivorous species feeding on the vegetation. But if its grazing is excessive, it competes with other herbivorous species that consume tne same plant species to the detriment of those species as well as itself. On the contrary, an herbivorous species that materially reduces an otherwise highly competitive plant species, and allows the increase of less aggressive ones, benefits those herbivorous forms that feed upon the now-increasing, uncompetitive plant species.

There are numerous examples of tnese animal interactions. Bison in pre-European North America were grazers with food preferences very similar to those of domestic cattle. Limited numbers of each could coexist today on the same area without detriment to each other as long as the common grass resource was not exhausted. But excessive numbers of each would undoubtedly lead to competition between them, and to the detriment of one or both. Similarly Rocky Mountain bighorn sheep are also primarily grazers. In some areas they appear to have suffered from competition with cattle and to have declined.

Some species are benefitted by the presence of others because of complementary feeding patterns. Pronghorn antelope are primarily shrub and forb feeders. Bison grazing in presettlement America applied pressure to grasses that allowed shrubs and forbs to coexist. Hence bison formerly, and probably cattle today, enhanced pronghorn numbers. Similarly, cattle grazing in the intermountain West promoted the increase of shrubby species in the mountains that were beneficial to deer. The latter increased in the twentieth century to densities unknown by the early settlers.

Clearly, each tract of land is capable of supporting a wide range of alternative vegetation types and combination of animal species, both wild and domestic. Many of these could be considered to be in "a thriving natural ecological balance" as alternative expressions of the potential of each tract. Of course, herbivorous pressures can be excessive, and vegetation production and abundance significantly reduced from their potential. This stage can lead to soil loss, alteration of the water budget, and reduced carrying capacity for the animals.

All of tnis may seem to be a circuitous route to assigning a meaning to the term excess. But it constitutes the background for saying that the term has both a biological and social aspect to it. Biological excess, in our judgment, exists when the number of herbivores present degrades the ecosystem to the point where it is producing goods and services well below its potential, and particularly where the long-term productivity and capacity for ecological recovery are impaired. Excessive water runoff and soil erosion might be indicators of this state of affairs.

Such excess can occur with only a single species of grazing animal, or with some combination of two or more. For an oversimplified example, if a given area can properly carry 1,000 grazing animals but has 1,500, then 500 are in excess. It makes no difference whether the 1,500 are horses, cattle, or a combination of both. An excess still exists, hypothetically assuming equal substitution. In effect, there

is a carrying capacity for 1,000 mouths, and the 500 additional constitute the excess.

Which of these species of animals should be carried in a given area becomes one of human values or preference. Biologically, the area may be able to support 500 cattle and 500 horses, and may be carrying them. But if the weight of public opinion calls for 1,000 horses, the area can be said in this context to have an excess of 500 cattle.

For these reasons, the term excess has both biological and social components. In the above example, biological excess constitutes any number of animals, regardless of which class, above 1,000. Social excess depends on management policies, legal issues, and prevailing public preferences.

In summary, then, we consider excess of any large herbivores to be that number of animals which exceeds the number that allows a range ecosystem to exist at some condition approaching its potential (maximum productivity), or prevents it from becoming "as productive as feasible" and improve toward its potential.

Potential varies from locale to locale, depending on soil, climate, and other variables. Excess varies locally, depending on these variables and on the condition of the vegetation at the time of assessment. If the vegetation is in poor condition, excess may be a small number. If it is in good condition, an area may carry large numbers of animals, and excess may be a large margin above these. For these reasons, potential and excess must be judged independently for each locale.

Alternative expressions of potential, involving different vegetation types and combinations of herbivores, are possible for a given area. Decisions on which of these alternatives should be managed are sociopolitical decisions and need to be based on a knowledge of prevailing economic and social values. Such decisions, too, will vary from locale to locale and presumably would be made through the BLM and Forest Service planning procedures.

Properly, management plans designed to achieve appropriate stocking levels on specified areas require a strong information base, including:

1. an estimate of vegetation, soil, and water potential for the areas in question
2. numbers of herbivores of different feeding types, and their various combinations--in essence, alternative management options--that can be carried on an area without significantly changing it from its potential
3. kinds and amounts of forage required by the animal species in question, and their habitat preferences
4. both the positive and negative effects of the herbivores on the vegetation, and consequent secondary effects of the animals on each other
5. effects of the proposed plan on soil and water resources
6. an understanding of the various human values and desires associated with the alternative decision options

We prescribed a broad array of research projects in Phase I to provide this range of information. Since most of them were never initiated, we do not have sufficient data to prescribe this level of informed management. We can summarize the results of the few projects that were funded and add additional, relevant information from literature not reviewed in the Phase I Report. These provide a few bits of information toward a broad underpinning--in effect a few tiles in a largely incomplete mosaic.

The remainder of this section will discuss this biological information relevant to formulating sound management plans. A later section will address the sociopolitical and economic factors.

Biological Information Needed To Formulate Sound Management Plans

In view of the scanty information specifically pertinent to biological aspects of decision-making on horse and burro grazing, three Phase II research projects were commissioned. One by University of Wyoming researchers studied the distribution and habitat use by cattle, wild horses, and pronghorn antelope in the Rock Springs area of southwestern Wyoming. A complementary study by another group of Wyoming scientists, also in the Rock Springs area, examined specifics of diet selection and grazing impacts on individual forage plants under known levels of animal density, including both horses and cattle. The third, by Colorado State University researchers, was designed to quantify forage consumption rates of wild horses, compared to cows, and to relate this information to animal size and physiological status (lactating versus dry animals). The latter project also studied dietary habits of horses and cows.

Additionally, independent work not under the overview of this Committee has proceeded during the 2 years since the Phase I Report was issued. Noteworthy in this category are the studies in southeastern Oregon by Oregon State University scientists (Martin Vavra, personal communication, 1982) and one by Utah State University investigators in northern Utah (Reiner, 1982). The salient points of all of this research are highlighted below as they relate to updating findings published in the Phase I Report. The reader is urged to refer to the original reports for particular details not covered in this treatment.

Assessing Site Potential The amount of forage produced annually on rangelands of the West is extremely variable in both time and space. (Here forage is considered as plant material that is sufficiently palatable and available to be consumed by large herbivores.) Precipitation and temperature patterns are the major forces in this variation, but other important factors include botanical composition or successional status of the plant community (range condition in the range manager's lexicon), temperatures, and soil features (depth, texture, stoniness, chemical limitations).

Some examples give perspective to this inherent variation: On salt desert shrub ranges in southwestern Utah, yields ranged from less than