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# RANGE MANAGEMENT

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## What Is Range Management?

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The title of this article was given me. Wags may place it under the name of our journal, with startling results. However, probably no one will become alarmed by the possible implication that we do not know what we are about. The topic, I believe, should remain appropriate always. Range management means something different as we learn more.

### Concepts Have Changed

From the beginning, range management has meant that, at least, there was some limit on removal of the growth of plants. But the limit for acceptable management before 1900 was different by 1920, and the 1920 limit is not acceptable today. The following quotation, taken from a USDA bulletin written for western ranchers shortly before 1900, gives some indication of what could pass departmental editors on this subject at that time:

"It is rarely if ever the case that even the close grazing of grass injures it, so long as the roots are not disturbed, but during the long droughts stock frequently pull up grass by the roots and in that way permanently injure the range."

By 1920, and for some years thereafter, the most widely held opinion among professional rangers was: that on short-grass plains at least 15 percent of the available crop of palatable herbage should be left unused at end of the grazing season and, that on mountain bunchgrass ranges 20-25

percent of the current year's growth should be left on the more palatable species. Today the recommendation is more commonly to leave 50 percent or more if grazing is during the growing season. This seems necessary to obtain maximum and long sustained production from any group of range grasses. Such changes correspond with advances in plant physiology and the increasing knowledge of the dynamics of plant communities.

Proper degree of use, though perhaps the most important, is but one facet of range management. Other interesting changes from earlier conceptions have occurred. There has, quite generally, been change:

- (1) From general condemnation of range burning, to recognition that there are instances where it can be beneficial.
- (2) From listing the invasion and increase of ungrazable plants as a cause of range depletion, to listing poor range management as a common cause for their increase and invasion, and
- (3) From managing ranges for species with highest nutrient content in percent, to managing ranges for species producing the most nutrients in pounds per acre—with seasonal feeding of concentrates in many cases.

### Need to Inventory Current Meaning

More changes might be listed but

these examples are enough to show that whatever is range management today may not be range management tomorrow. Moreover, there probably is no written definition that would be acceptable throughout the profession, even for today. However, there is need to inventory what may be included and what must be excluded. Those concerned with college curricula, whether student or dean, are concerned with this problem. As a technician, I have been almost continuously confronted with it; particularly when working with technicians of other disciplines.

The problem becomes acute when dealing jointly with problems of land use and treatment on large areas such as watersheds, and in mixed farming and ranching country. There, the question of "What is range management?" must usually be preceded by an answer to "What is range?" And that answer must satisfy economists, agronomists and foresters as well as rangers. I admit that professionals in other disciplines have partially forced me to my current definition of range, and that the science of ecology has contributed the foundation for an answer.

### A Definition of Range

A satisfactory definition of range appears to be: *Native pasture on natural grazing land.* By natural grazing land is meant land on which the climax vegetation is natural pasture. Examples occur in most natural deserts, prairies, pampas, steppes, savannahs and coastal marshes. This is an entity for which numerous management principles may be stated that will apply to the whole. Without this degree of unity in subject matter, it has seemed that very little could be said, with certainty, about range management. With other

generalizations of range, it has seemed necessary to so extensively qualify most prescribed actions, that the whole became confusing rather than enlightening.

Most Spanish language references concerning South American ranges do not mention range, but use their term most nearly equivalent to our word "range", namely, *los pastos naturales*. Literally that is "the pastures natural", or natural pasture. The term "natural pasture" is an acceptable briefing of the definition given above. This specificity has been found very helpful. By contrast, results from using the term "range" in the English dictionary sense commonly lead to misunderstandings and trouble.

#### Distinguishing Range for Agronomists

Rangemen and agronomists have much in common. Yet agronomic terminology has at times perplexed me. As an example, there is the occasional recording and publicizing of all established seedings of introduced and domesticated pasture species as "improved pastures". This might cause no trouble deep in a forest climate. But in a grassland climate where we were working together, a part of the public was inadvertently led to believe that all natural pastures were unimproved, and therefore quite undesirable. Actually, on the natural forest sites nearby, all native pastures were undesirable if compared with tame pastures. However, in the same general area were many native pastures on natural grassland sites that had been much improved by management of grazing alone. These were not "extensive" pastures in terms of area, nor "open" in the sense of lacking fences and occasional trees. From the standpoint of cost to produce a pound of beef, some were far better pastures with their native perennial bluestems than the adjacent so-called "improved pastures" with their exotic self-sowing annuals and short-lived perennials. But the agronomists were no more to blame for this confusion than

myself, because I had not provided alternative concepts with a specific terminology.

For a time I even preferred to believe there was little difference between range management and agronomic management of pasture land. Hence, it appeared that their concepts and terms should amply serve us both and that what was applicable on tame pastures, in general, also should be applicable on native pastures. But I learned that the heritage of literature, training and experience in agronomy is overwhelmingly from climates and soils where production of cultivated crops is possible; and that solutions to problems are taught and thought in terms of seeds, machines and fertilizers. This background points toward destroying plants that volunteer, limiting or preventing competition between plants, harvesting what is harvestable each year, correcting undesirable composition of plant cover by seeding desirable kinds and fertilization to increase production. The likelihood of this leading to conflicts with ordinary procedures in range management will be apparent to all range technicians and ranchers.

Agronomic literature on management of grazing refers more frequently to maintenance of plants in succulent condition by mowing or periodic close cropping than it does to maintenance of root reserves and ground cover to promote infiltration. Rest from grazing to permit pasture improvement through plant succession is, of course, wholly foreign to agronomy. Natural plant succession destroys tame pastures. Loss of stand on perennial tame pastures because of close grazing is rarely mentioned, probably because most tame pastures are planted to later be plowed up, in order to increase production on a cultivated crop. Where the pasture is not in a crop rotation, loss of stand by grazing is still no catastrophe as it might be on steep arid range land, because the agronomist's pasture is generally on arable land and in a

climate where each year brings enough moisture to establish pasture. Moreover, close grazing during the final years of a tame pasture provides forage of higher protein content than the moderate grazing necessary to prolong life of the stand.

Extensive seedings in range country of introduced or domesticated native species, in pure stands or simple mixtures, are now becoming quite common. Let us examine the result of calling such seedings "range" rather than tame pasture. The grazier, and even the technician unspecialized in range ecology, is thereby led to believe that the management of the new seeding will have something, if not everything, in common with the surrounding natural pasture. Yet natural plant succession operates as certainly to destroy this tame pasture seeding as it does to improve natural pasture and all true range seedings.

In the matter of viewpoint on proper land use, too, I commonly have had experiences that were revealing. An agronomist, when viewing the abandonment of cultivation in a grassland area, such as the Dust Bowl, is likely to suggest that such "submarginal land" should be "retired" to grass. To the range man this is not retirement of land. It is putting land back into production. Moreover, although the land may be submarginal for cultivated crops, it usually is choice range land.

Other contrasts in approach to problems are sometimes evident when standard agronomic viewpoints are carried over into range fertilization. An instance is recalled where a research bulletin reported greatly increased carrying capacity through range fertilization. When this pasture was visited shortly after the results were published, the fertilized pasture no longer carried any livestock because the grazable native perennials had been killed out in obtaining the figure on "increased carrying capacity", and the invading annuals had not received

enough spring moisture to provide grazing that year. Meanwhile, the control pasture, which was still native perennial range, continued to carry its regular number without cost of fertilization or reseeding. If measured by accepted standards for tame pastures in humid climates, the experiment had run long enough and change in species composition could be ignored. But this was native pasture on a prairie site, in other words a kind of range.

#### Distinguishing Range for Foresters

Range management, as now most commonly understood in North America, grew out of forestry; specifically, forestry of the U. S. Forest Service on the National Forests. This is not intended to belittle the pioneering range work of others; notably that of Jared G. Smith, some colleges and universities, and of individual stockmen. Nonetheless, it is believed that without the documented experience of the U. S. Forest Service and the demand for professional rangemen, which they originated, range management would not now be established as a separate professional discipline. The offshoot may have developed to have more in common with agronomy and ecology than with its parent, but such situations are not new. A parallel situation is found in the origin of botany from medicine; two fields that now have little in common.

Evidently we have inherited the term "forest range" from this parenthood. Forest grazing is a reality; and range forestry, as in shelterbelts, is a reality. Moreover, there is National Forest range, and there is grazing on the National Forests. But the term "forest range" has led to misunderstandings; while reference to "forest grazing" has improved understanding only when it was made clear that it applied to grazing on forest sites.

The term "forest range" appears to mean a certain kind of range, but it usually includes an un-

### THE ANNUAL STUDENT ISSUE

This number of the Journal represents the sixth Annual Student Issue in which attention is directed to education in range management. Education in range management, whether for the rancher, the student, or the professional worker, is and will continue to be one of the important tools in the achievements of the objective of the Society to foster advancement in the science and art of grazing land management.

This Student Issue, assembled under the direction of Prof. Gene F. Payne and Dr. Farrel A. Branson of the Department of Animal Industry and Range Management at Montana State College, is witness to the growing interest and progress in range management education at both high school and college levels.

A notable feature of this year's issue is the emphasis placed on range youth education at the high school level. Two contributed papers feature the recent development of judging contests in range and pasture management as teaching methods for 4-H, FFA and other youth organizations. Awakened interest among youth in the proper utilization and management of our range resources is exemplified by the prize-winning essay by a Utah high school student presented on page 203.

Ten student articles and editorials contributed for this issue and a Range Student Roundup of activities at nine colleges offering special training in range management provide an excellent perspective of current teaching and research.

assorted mixture of natural forest land and natural pasture land. Where there is volunteer pasture on forest land I have found it misleading to refer to such pasturage as range along with that from natural pasture lands. The transitory nature of grazing on forest sites should be clearly distinguished from grazing on range sites because the latter alone is to be regarded as a permanent grazing resource. To include both types of sites in a general area designated for multiple use has not adequately met the problem on private lands. Where there is some grazing land within a generally forested area on which the climax is natural pasture, rather than forest, it has been best to designate that portion as "range" and to add any grazing available from forest sites as "forest grazing".

Range obviously cannot encompass both forest sites and natural pasture sites, and still have unique and universal principles of management. It was to make this distinction with native pasture on forest land that range was defined as occurring on natural grazing land, as well as being native pasture.

#### Distinguishing Range for Economists

Economics, of course, enters strongly into whether or not arable natural grazing land can best be used for native pasture, tame pasture or cultivated crops (including tree crops which, incidentally, also must be cultivated if successfully grown on natural grazing land). Economics also enters into problems of the degree to which the grazing resources of non-arable range lands should be shared between livestock, wildlife, recreation and watershed interests. But such economics are aside from the main topic.

Economists have questioned the concept of range being presented here on the grounds that it does not provide a lower limit of usefulness for natural pasture; a limit below which the land would not be

regarded as range. There is indeed some land so arid, so rocky, so saline, so steep, or otherwise inherently so unproductive that although it does naturally provide some native pasturage, the quantity is so small that to term it "range" is misleading. To graze it with domestic livestock may be quite uneconomic. And from a stockman's viewpoint it may better be called waste land than range land. I have found no way to satisfactorily incorporate this economic concept in a definition of range because this lower limit fluctuates with economic conditions and also varies with the type of ranching operation.

#### **A Definition of Range Management With List of Elements**

With this clarification of what has been included as range, and what excluded, and why, it should be possible briefly to define range management as: *Economic improvement or maintenance of natural pastures for the production of animals and animal products.* This does not preclude wildlife management, or watershed management, or application of some forestry practices on range areas. Rather, other disciplines, which may be practiced on range, are thus also left some autonomy in developing their principles.

The ecologist Frederic E. Clements listed the main factors in range improvement in a 1920 publication of the Carnegie Institution. They seem equally appropriate today, and each can be reconciled with use of the term range as previously described. The

essential factors were presented as seven processes, namely:

(1) *Proper stocking*; to be determined by actual trial accompanied by measurement of the result,

(2) *Rotation or deferred grazing*; under which Clements included all methods of alternate grazing and rest, whether both occurred in one year or more,

(3) *Control of rodents, poisonous plants, weeds, etc.*; and here the importance of natural succession is stressed, along with direct measures by man,

(4) *Manipulation of the range*; including use of fire, irrigation, fertilization, cultivation, cutting, sowing and planting,

(5) *Development of feed and forage for droughts and winter*; to permit better utilization of the range and against the chance that weather may be abnormal.

(6) *Development of water*; to permit more even utilization of the range, and

(7) *Herd management*; under which is included all features which relate to the handling of livestock such as fencing or herding methods that can contribute to the improvement or prevent deterioration of the range.

Since maintenance is prevention of deterioration, little more need be said about it except that range improvement should continue at least until abnormal losses of soil and water have been halted at which time maintenance may be considered range management.

#### **Range Management Versus Range Work**

Since the foregoing may in total seem to unduly circumscribe what

may be range management, a conjoined viewpoint should be that range managers and range technicians must know much more than just range management. A forage chemist profits by knowledge of animal nutrition and a rangeman profits by knowledge of animal husbandry. But chemistry does not include animal nutrition nor does range management include animal husbandry. In areas of range where wildlife management, or watershed management, or forest management, or production of cultivated feed and forage crops is especially important, the rangeman should be especially well informed in the importantly related field or fields.

It is believed that range management, as described here, can develop as a science; but that the work of the range manager and the range technician will remain an art, using many sciences. We are in need of a word to describe this broader field of a rangeman's training, knowledge and work. The foresters have the word "forestry" to use in the broad sense for the art, as contrasted with the science of "forest management". Since we rangemen now evidently lack an appropriate word for our art, I have used the inadequate term "range work".

Definitions of both range and range management have been offered, primarily to aid in pointed discussion. The definitions appear satisfactory viewed from my experience. Whether or not they are acceptable in light of yours, the discussions may be regarded as an attempt to orient and clarify the question of "What is range management?"

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*Plan now to attend the Ninth Annual Meeting of the American Society of Range Management to be held January 23-27, 1956 in Denver, Colorado.*