Grazing Marginal Ranges in the Southwest

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Highlight: *The sensitive rangelands of the Southwest are a delicately balanced arrangement of thin soils, sparse vegetation, and limited precipitation. Grazing must be carefully regulated in order to protect the delicate ecosystem. Steep slopes and rugged terrain require special consideration.*

Marginal Ranges

To understand the term "marginal range," one must first have an appreciation of desert and semidesert range and the sensitive nature of the associated soils. Add to this the steep rugged terrain of the Southwestern mountains and their subsequent susceptibility to erosion when this delicate ecosystem is altered. The following discussion enlarges on this problem and considers the added impact of grazing.

Springfield,[1] in his discussion of the grasslands of New Mexico, points out that there is no accord among students of vegetation as to what constitutes desert and what constitutes grassland and that criteria for differentiating between the two should be more clearly defined. There seems to be a general acceptance that perennial grass is the key to the semidesert grassland as opposed to the annual or ephemeral feature of the desert ranges. Others would prefer to break the two on the basis of precipitation, from 3 to 8 inches being closer to desert and from 8 to 15 inches being the semidesert. Both areas, however, classify as either arid or semiarid, and following Merriam's System would be included in the Lower Sonoran and Upper Sonoran Zones.

Soil temperatures during the growing season in these arid and semiarid areas are very intense, and there is little chance for seedling survival unless a sufficient amount of litter and humus is present to maintain moderate surface temperatures and adequate soil moisture. Litter often oxidizes in the arid climate. During drought periods, moisture stress on grasses is often sufficient to kill many plants. During these periods plant populations have a tendency to be reduced to the hardier, deeper rooted, or otherwise more resistant plants. Bare soil interspaces and lack of litter can become quite pronounced.

Summer thunderstorms are of a torrential nature in the Southwest. Most moisture comes from the Gulf of Mexico as a result of the Burmuda "highs and lows." Over half the yearly total precipitation comes between June 15 and September 15.

The erosion often resulting from summer thunderstorms is understandable, particularly if plant cover and litter is not sufficient to break raindrop impact and to protect the land from the scouring runoff action.

Studies in northern Utah (Dunford and Weitzman, 1955) indicate soil loss appears to be unimportant when 5% or less of

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[1] Springfield, H. W. 1951. The grasslands of New Mexico: their distribution and classification. Unpublished manuscript, Rocky Mountain Forest and Range Experiment Station, Albuquerque, N.M. 159 p.

the rain from summer storms runs off the soil surface. To keep surface runoff below this limit, at least two-thirds ground cover of living plants and litter is needed. Studies by Anderson (1969) indicate that 30–60% slopes may require two times more cover than gentler slopes to remain relatively stable.

Theoretically, if we cause natural geologic erosion to be exceeded, we are creating additional stresses on the ecosystem. To what extent land management activities can exceed this natural rate is questionable.

A technique for determining on-site erosion and erosion hazard has been developed and is being used by Region 3 of the U.S. Forest Service. Standards for plant cover and litter needed (Forest Service, 1974) can be measured by first determining the amount of cover and erosion on protected or well managed sites (natural erosion) and then determining the degree of departure from these standards on sites under study.

Steep slopes in the 3,000 to 7,000-foot elevational range of the Southwestern desert and semidesert mountains and foothills are particularly sensitive, because of the requirements for more effective soil cover. There is also the danger of greater accelerated runoff and easier soil displacement by livestock.

Extent of the Marginal Ranges in Arizona

Figure 2 is a schematic map that portrays the extent of the marginal ranges in Arizona. These ranges are within or closely allied to the three major deserts in the Southwest—Colorado, Mohave, and Sonora. The Sonora Desert is the most intrusive and extends northeasterly toward the Mogollon Rim.

While not all inclusive, the following list in general outlines the extent of marginal range areas in Arizona: The Dragoons, Whetstones, north end of the Santa Ritas, Dos Cabezas Mountains, Galiuros, Winchesters, lower slopes of the Pinalenos and Catalinas, Santa Teresas, Blue Range, Pinals, Rincon Mountains, Superstitions, Mazatzals, Cabeza Prieta Mountains, Boboquivaris, Kofa Mountains, Silver Bell Mountains, Sand Tank Mountains, Gila Bend Mountains, Maricopas, Growler Mountains, Mohawk Mountains, Trigo Mountains, Dome Rock Mountains, Buckskins, Harcuvan Mountains, Black Mountains, and a myriad of lesser hills intermingled throughout.

History and Problems Associated with Grazing Marginal Ranges

Prior to the creation of the Forest Reserves and before allocation of the Public Domain, many thousands of cattle roamed at large across seemingly endless desert and semidesert grasslands. Much effort was made in securing the ranch headquarters, natural springs, and holding areas. Cattle roamed at large over adjacent holdings, as there were only natural barriers to stop them.

In the early 1900's, after only 30 years or so of intensive livestock grazing, the resources, particularly the bottomlands, had begun to deteriorate seriously. As the bottoms deteriorated and became less productive, the cattle began working the ridges and slopes.

The yearlong grazing practiced on these range areas has further aggravated the problem. Constant use, particularly on early spring grasses, forbs, and shrubs, has seriously depleted many areas and further reduced plant cover.

Yearlong grazing has always been customary. The mild winters usually generate spring growth early in February and March. Many ranches in the more rugged mountains are cow-yearling oriented operations. Ranchers here find it more practical to move the larger calves when they are big enough to negotiate the rough terrain and leave the mother cows pretty well "located" year round in their home surroundings.

Deferred grazing or rotation grazing has largely been avoided because of the problem of re-locating cattle on new areas or simply because of the difficulties of physically moving the cattle over rugged terrain.

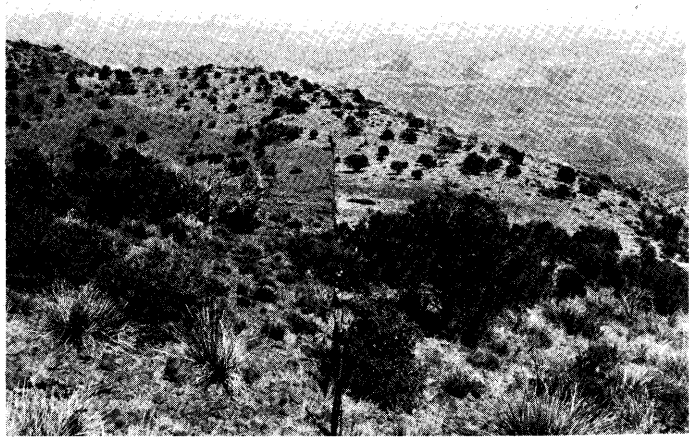

Fig. 1. *Plant cover is often insufficient for soil and watershed protection.*

Future of Grazing Marginal Range

Land administrators in the public agencies are taking a close look at stocking rates and grazing capacities on the sensitive areas of both desert and semidesert range. The rougher-steeper marginal areas are receiving particularly close scrutiny. Land use planning and allocation of the resources to the most beneficial use or uses is focusing public attention on these areas. Watershed, recreation, and wildlife values are receiving more emphasis than ever before.

The land managers, the ranchers, and the permittees are concerned and are looking for reasonable ways to resolve

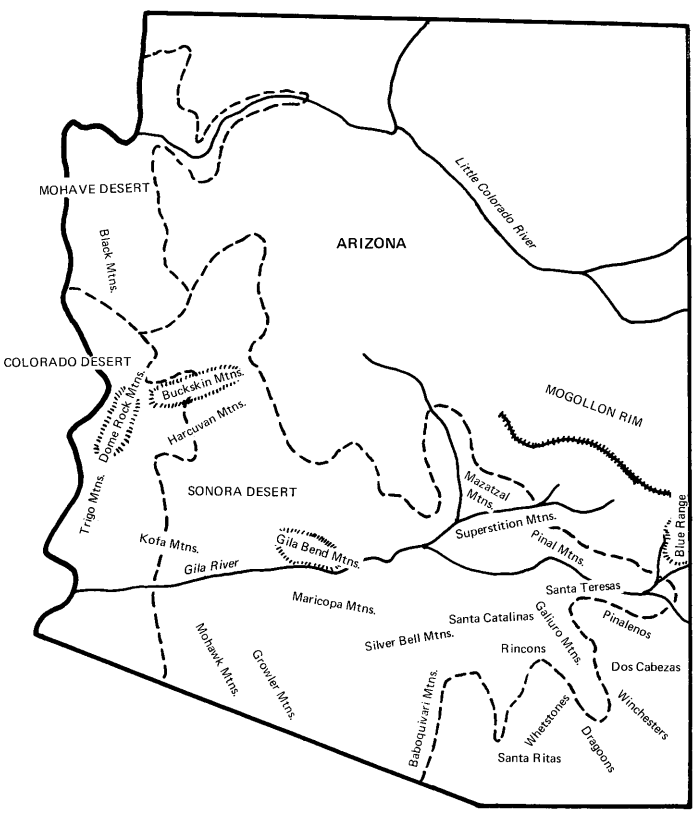

Fig. 2. *Extent of marginal ranges in Arizona.*

conflicts between these uses and to limit grazing pressure on sensitive areas.

In order to get to the root of this problem, it is important to recognize some basic fallacies and to be looking at some practical alternatives.

Ranchers and land managers historically have visualized more available grazing area in steep rugged country than actually exists. The old adage, "If you had it all flattened out you would have twice the grazing area," just doesn't hold true. The truth is that the very nature of rough country forces cattle to concentrate their use on the canyon bottoms and the ridge tops. The benches and side slopes get somewhat lighter use but only after the bottoms and ridge tops are used heavily.

Consequently, many of the "grazing areas" are heavily overstocked. This has shown up in seriously eroded canyon bottoms, depleted hillsides, flash flooding, and deteriorated water quality.

To arrive at a true grazing capacity, one that will not deteriorate the bottoms and sensitive watersheds of the hillsides, stocking rates should be calculated only on the basis of the bottoms, ridge tops, and benches close to water. A nominal allowance may be made for the sidehills, but only if it does not overstock the other areas.

In addition, a grazing system must be provided with periodic rest on areas that are grazed. Rest rotation providing a combination of yearlong rest and partial deferment is needed. No longer can the reasoning be accepted that strange cattle cannot be "located" and will not do well on rest rotation. Ways must be found to accommodate these problems and provide for rest to maintain forage plants in the usable grazing areas.

Grazing systems are being initiated on the Apache-Sitgreaves National Forests in southeastern Arizona on Eagle Creek and on the Blue Range where stocking rates are being reduced to levels commensurate with the suitability of the land. The same is true for allotments on other National Forests and Bureau of Land Management lands and private holdings.

These systems involve rest rotation; for examples, use one pasture, rest two, alternating 3 pasture rest systems, and winter use with alternating rest.

There are other systems, *but the important thing is to get the stocking rates in line and get a rest system in operation before someone else settles the future for these areas instead of the range specialist and the rancher.*

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