

## USE OF SLOPES BY CATTLE IN RUGGED TERRAIN

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Returns from rangelands and livestock are greatest when animals uniformly utilize forage resources. On rangelands, however, cattle often concentrate on some areas and completely avoid others. Dispersal of cattle about the landscape is influenced by several interacting environmental, managerial, and animal related factors. Environmental factors include seasonal weather conditions as well as the distribution patterns of food, water, and topography specific to an area. Managerial aspects include fencing, salting, water development, herding, and the enhancement of forage quantity or quality. Some of the animal factors influencing cattle distribution are breed of livestock, class of animal, previous experience of the animal, formation of social groups, and, in large pastures, a demonstrated home range behavior.

Consensus among most researchers is that environmental factors (primarily rugged topography and limited water) have the greatest influence on livestock dispersal on western ranges. Short of fencing and water development, management efforts aimed at enhancing cattle distribution under such conditions are usually only marginally successful.

Realizing that cattle avoid rugged topography, range managers occasionally select a slope gradient and assume in forage allocation procedures that herbage on steeper slopes is unavailable to the grazing animal. Our work with cattle in relatively rugged terrain illustrates, however, that such limits should not be arbitrarily applied to livestock or grazing allotments.

### RESEARCH LOCATION AND PROCEDURES

This research was conducted in three pastures on the east bank of the Owyhee Reservoir in southeast Oregon. The area is administered by the Bureau of Land Management and is grazed by cow-calf pairs with a deferred rotation system from April 1 through October 31. Data were recorded during the 1979 and 1980 grazing seasons. The percent slope, or average slope if more than one animal was sighted, was recorded whenever undisturbed livestock were observed. Each recording was treated as a single observation regardless of the number of animals involved. To evaluate animal preferences for slope it was necessary to determine what proportions of the area occurred on the various grades. These data were derived by sampling 1,300 random points on topographic maps of the pastures. Cattle data and pasture composition were compiled in 10 percent slope categories ranging from 0 to 50+ percent. Statistical analyses were used to evaluate livestock preference or avoidance of the various slope categories.

## RESULTS AND DISCUSSION

Topography on the area ranged from level basins to nearly vertical cliffs with average slope for the study area being a 35 percent grade. Slope in the three pastures averaged 19, 35, and 37 percent, respectively, for pastures A, B, and C. The proportion of each pasture and the percent cattle observed in each slope category are presented in Table 1.

Table 1. Percent of available area and percent of observations of cattle occurring on slopes in three pastures. The +, 0, and - preference ratings indicate significantly favored, indifferent or avoided categories, respectively

Pasture	Percent slope					
	0-9	10-19	20-29	30-39	40-49	50+
A						
Area available, %	23	36	24	11	2	4
Observations of cattle, %	82	15	3	0	0	0
Preference rating	+	-	-	-	-	-
B						
Area available, %	11	20	19	13	10	27
Observations of cattle, %	79	18	3	0	0	0
Preference rating	+	0	-	-	-	-
C						
Area available, %	16	17	13	14	12	28
Observations of cattle, %	70	20	5	5	0	0
Preference rating	+	0	-	-	-	-

Cattle showed a strong preference for relatively gentle topography with the 0 to 9 percent slopes being the most heavily used category in each pasture. Because the percentages of cattle observed in the 0 to 9 percent category were greater than the available percentages, this category received a positive preference rating in each pasture.

In pasture A, 36 percent of the area occurred on slopes between 10 and 19 percent. However, only 15 percent of the observations of cattle occurred on these grades, indicating cattle avoided these slopes in pasture A. In the two more rugged pastures (B and C) cattle appeared indifferent to the 10 to 19 percent slopes. Because their use of these slopes was roughly equivalent to their availability, we could not specify whether cattle favored or avoided this degree of slope in these two pastures.

Slopes greater than 20 percent were avoided by cattle in all three pastures. The upper limit of slope use by cattle was the 20 to 29 percent category in pastures A and B; cattle in pasture C, the most rugged of the three, were observed on slopes in the 30 to 39 percent category.

These data demonstrate that use of slopes by cattle was not consistent from pasture to pasture. Cattle obviously favored relatively level terrain, and where large expanses of gentle topography were available, they avoided steeper slopes. They did, however, alter their habits to some degree and graze steeper grades when little level terrain was available. For these reasons, utilization limits or expectations derived in one pasture should not be expected to apply in another. Each grazing allotment and season provides a unique environment, and patterns of livestock use should be evaluated from actual observations and not compiled from statistics obtained under different conditions or on different areas.