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RANGE SCIENCE REPORT

Estimating Livestock Grazing Capacity on California Annual Rangeland

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Efficient grazing use of annual rangeland requires a quick, efficient, yet accurate and repeatable procedure to set initial livestock stocking levels. Information collected over a 30 year period on the San Joaquin Experimental Range and other locations in the state has enabled us to develop an estimating technique that integrates the myriad of environmental factors that affect forage production and livestock use into a simpler subset of easily measured variables—slope and canopy cover.

The scorecards developed contain grazing capacities based on: (1) the productivity of a site, expressed as the relationship between forage production and canopy cover; (2) grazing use, expressed as the relationship between slope and grazing pressure; and (3) a level of residual dry matter or litter, which indicates allowable grazing pressure and utilization. These variables are displayed as a field scorecard which the experienced range manager can use to estimate grazing capacity on annual rangeland along with actual livestock grazing use history.

The scorecard is best used to determine an initial livestock stocking rate or to estimate proper levels of grazing use in combination with a slope and cover map of the grazing area. Slope classes can be readily mapped from topographic maps. The canopy classes can either be mapped from field observations and transferred to the slope class map or be determined from aerial photographs or vegetation maps, if available. Grazing capacity is then estimated from the acres present in each of the 16 classes and their respective number of estimated Animal Unit Months (AUMs)—Tables 1-3.

This procedure is most effective on rangeland with significant amounts of land in a mosaic of different slope and canopy classes. In pastures with little land in

the most productive classes the system will significantly underestimate grazing capacity. Poorly distributed watering facilities and conditions hampering livestock travel may also lead to inaccurate grazing capacity estimates. Experienced range managers are urged to make realistic adjustments to account for long distances to water and poor travel conditions.

The scorecard is a compromise between detailed inventories of the important site factors and a procedure that can be practically applied. The system does not replace continued monitoring of actual use on an area, such as that suggested by Clawson (1990), which is the best method for determining grazing capacity. Once grazing capacity is determined, animal numbers may still need to be changed often, as dictated by weather, market, and other conditions. Adjustments in stocking rates are best guided by animal management requirements and the suggested minimum residual dry matter levels (Clawson et al. 1982). Allowable limits of residual dry matter are best measured or estimated on areas with slopes less than 25% and with less than 50% canopy cover. Suggested lower limits of residual dry matter (RDM) are listed on the scorecards.

Literature Cited

- Clawson, W. J. (ed.). 1990. Monitoring California's annual rangeland vegetation. University of California, Division of Agriculture and Natural Resources. Leaflet 21486.
- Clawson, W. J., N. K. McDougald and D. A. Duncan. 1982. Guidelines for residue management on annual range. University of California Cooperative Extension, Division of Agriculture Sciences Leaflet 21327.

Estimated Grazing Capacity Scorecards

Table 1. Southern California Zone (less than 10" precipitation)

Canopy Cover (percent)	Slope Classes (percent)			
	< 10%	10%-25%	25%-40%	> 40%
	AUM/Acre			
0% to 25%	0.7	0.4	0.3	0.1
25% to 50%	0.4	0.3	0.2	0.1
50% to 75%	0.2	0.1	0.0	0.0
75% to 100%	0.1	0.0	0.0	0.0
	RDM lb/acre			
	200	250	300	350

Table 2. Central Coast and Central Valley Foothills Zone (10" to 40" precipitation)

Canopy Cover (percent)	Slope Classes (percent)			
	< 10%	10%-25%	25%-40%	> 40%
	AUM/acre			
0% to 25%	2.0	0.8	0.5	0.3
25% to 50%	1.5	0.6	0.4	0.2
50% to 75%	1.0	0.4	0.3	0.1
75% to 100%	0.5	0.2	0.2	0.1
	RDM lb/acre			
	400	600	800	800

Table 3. Northern California Zone (greater than 40" precipitation)

Canopy Cover (percent)	Slope Classes (percent)			
	< 10%	10%-25%	25%-40%	> 40%
	AUM/acre			
0% to 25%	3.5	1.3	0.8	0.5
25% to 50%	2.8	1.0	0.6	0.3
50% to 75%	1.8	0.7	0.5	0.2
75% to 100%	0.9	0.3	0.2	0.1
	RDM lb/acre			
	750	1000	1250	1250