Grazing Intensity Guidelines

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Grazing management on rangelands is based on controlling the intensity, timing, frequency, and selectivity of grazing animals. Grazing intensity has been considered to be the most critical of these factors because high intensity grazing damages the eaten plants. Considerable controversy has existed over how grazing intensity should be measured. Over the past 7 years as researchers and consultants we have had the opportunity to evaluate grazing intensity on several rangeland sites in New Mexico using a variety of techniques. As a result of this experience we have been able to test and improve the approach of Anderson and Currier for evaluating grazing intensity that has reasonable simplicity, rapidity, repeatability, and accuracy. We will describe our use of the approach and discuss modifications we have developed for some major rangeland types in New Mexico.

The Problem

A number of reviews have pointed out the problems associated with the various methods for evaluating grazing intensity. The most commonly used approach in various stocking rate studies has been using percent of forage utilized. It is generally more understandable to ranchers and the public than qualitative assessments of grazing intensity such as light, moderate, or heavy, or quantitative measurements such as residual vegetation, stubble heights, or percentages of ungrazed plants. Over long time periods percent forage use has been well associated with vegetational composition shifts, changes in forage production, livestock productivity, and financial returns. It has commonly been used as a basis for the harvest coefficient when stocking rates are determined. The harvest coefficient is the percentage of annual forage production assigned to livestock consumption.

In spite of these advantages, percent use has several drawbacks as a sole measure of grazing intensity. It is not easy to measure and, therefore, accuracy and precision can be important problems. Most importantly, during individual years determining percent use is difficult and does not always reflect grazing severity. Utilization percentages that are light in wet years due to regrowth can adversely impact rangeland health in dry years.

Various qualitative grazing intensity procedures involve visual inspection of range for characteristics such as vegetation patchiness, remaining seed stalks, hedging of browse plants, presence of livestock trails, proportion of ungrazed plants, soil cover, and so on. Based on these characteristics, grazing intensity for a particular range can be characterized as light to unused, conservatively used, moderately used, heavily used, or severely used. If observers are properly trained with pictures and inspections of pastures with known grazing intensities, thoroughly cover a range unit, and do some quantitative cross checking with stubble heights or residues, we have found qualitative assessments of grazing intensity can be fairly reliable.

Measurement of residual vegetation can be time consuming. Specific levels needed for protection in many range types have not been determined. Exceptions are the California annual grassland type and the shortgrass prairie in Colorado. We believe enough information is now available that residue guidelines could be developed for most range sites in the United States.

Residual vegetation better reflects grazing severity than percent use data because it determines how well wildlife, watershed, livestock, and esthetic values are maintained.

In recent years grass stubble height measurements have received greater use in grazing intensity surveys because they are closely associated with residual vegetation. Minimum stubble height guidelines have been developed for various range grasses (see Heady and Child 1994, Holechek et al. 1998). Generally, we have found stubble heights can be evaluated quickly, accurately, and with reasonable repeatability among observers.

Our Approach

Basically our approach to evaluating grazing follows Anderson and Currier with some modifications. We use general pasture reconnaissance, grazing intensity categories, mapping of use zones, and stubble heights as indicators of grazing severity. We have modified the grazing intensity categories based on research from New Mexico rangelands (Table 1). In addition, we establish 1–2 key areas per pasture for more intensive monitoring. Typically we select key areas that are representative of the pasture and 0.75 to 1.00 mile from water. Here we evaluate end of grazing season ungrazed forage production using 3 to 5 large (16 sq. feet) moveable cages; grazed forage residues at the end of the grazing period; and grazed and ungrazed stubble heights of key grasses. Prior to forage regrowth after dormancy we also take photographs along permanent transects as suggested by Sharp et al. (Figures 1, 2, and 3). We always calculate a percent use coefficient based on forage standing crop inside and outside the cages. We recognize that cages can differentially affect forage production compared to uncaged areas, therefore we also attempt to cross check this coefficient by clipping some ungrazed or lightly grazed patches of vegetation on the site and comparing that with grazed areas. While we consider the percent use coefficient useful as an indicator of harvest efficiency and grazing severity, we do not believe it should be used as a sole measure