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Cows in Space

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Cows in Space

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Introduction

A great deal has been learned about foraging behavior and livestock distribution in the last several decades. We hope to apply and fine tune this knowledge to reduce the impacts of beef cattle on riparian areas, surface water and wildlife habitat. Likewise, to use cattle as a tool to manage weeds we need to be able to attract cattle into patches of undesirable species.

Beef cattle and other grazers focus on water sites and sites that provide thermal comfort, foraging away from these focal points to meet their nutritional needs. Most ungulates first harvest food, then move either to loafing and bedding sites to ruminate and digest the food ingested in a previous grazing bout (meal), and/or to areas for predator avoidance. The distance covered by the animal during foraging depends on digestive capacity, rate of passage, forage harvest rate, grazing velocity and level of hunger. Once satisfied the animal returns to a thermal, water or bedding site depending on their needs and priorities.

Time spent grazing depends on forage availability, forage quality, and thermal balance. Animals reduce daily grazing time as digestibility of available forage declines and retention time of ingesta increases. When daytime temperatures are within the thermal comfort zone of cattle, most grazing takes place during daylight hours. During hot weather cattle reduce afternoon grazing and increase night-time grazing. Most researchers report little grazing and traveling after darkness. However, recent nighttime observations at San Joaquin Experimental Range in Madera County indicate that grazing and change of bedding sites do occur during darkness on some nights.

The objective of this study at UC SFREC is to understand where beef cattle distribute themselves in a typical foothill oak woodland or annual grassland during a 24 hour period and how this may change seasonally. Studies on private ranches are underway to document the effectiveness of protein supplement sites as attractants for beef cattle at different distances from stock water and riparian areas.

Methods

Four pastures, arranged in pairs were grazed for one week each during four seasons (January, March, April-May and August) of the year. One pair of pastures was an open woodland and the other pair had been cleared and was mostly devoid of trees except in the riparian corridor. Two herds of 20 cows grazed one pair of pastures one week and the other pair the following week during January, March, April-May and August. Six of the cows in each herd were equipped with global positioning collars that were programmed to take a position fix every 5 minutes for each one-week grazing period.

These positions were downloaded from the collars, corrected and loaded into a geographic information system (GIS). Using the GIS the positions will be overlaid on aerial photos, slope class maps or other layers for visualization and analysis of grazing, resting and traveling time and location. Two years of data collection was completed in late March 2003. Data from this study is currently being analyzed.

Preliminary Results

1. Distribution is heavily influenced by slope which has been found by many researchers.
2. Cows tend to return to graze in locations grazed in the past. This results in frequently used patches and seldom used patches reducing the carrying capacity of the pasture. Infrequent use results in a build up in litter that interferes with efficient foraging. Conversely, the frequently used sites do not have a build up of litter and can be used very efficiently by grazing animals year after year.
3. As forage near the water site is used cattle distribution increases.
4. Beef cows appear to return to the same bedding site each night.
5. The timing of morning and afternoon grazing bouts change with the seasons and are separated by a period of rest and rumination.