

Proceedings

Society for Range Management
67th Annual International Meeting
Orlando, Florida
February 8-13, 2014

ANIMAL-DRIVEN ROTATIONAL GRAZING PATTERNS IN A SEASONALLY GRAZED NEW MEXICO RANGELAND PASTURE.

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ABSTRACT

GPS data collected over four years on 52 young cross-bred cows grazing a 146 ha pasture were used to determine whether cattle establish patch scale rotational patterns within pastures. Cow positions at 5-min intervals were recorded with GPS collars during 25 d in late winter/early spring. Estimated per capita forage allowance (PCFA) was 347, 438, 1104 and 1884 kg of herbage per cow in 2004, 2005, 2006, and 2007 respectively. Cumulative winter/early spring precipitation (CPPT) was low in 2004 and 2006 (35 and 30 mm, respectively) and high in 2005 and 2007 (119 and 112 mm, respectively). Structured Query Language (SQL) codes developed specifically for this study were used to a) select GPS points associated with movement velocities ranging between 1 and 20 m/min (assumed grazing locations); b) overlay location data on a pasture map subdivided into 30x30m pixels; and c) calculate percent grazed pixels (% GP), pixel residence time (RT), revisit rate (RR), and return interval (RI) for each animal. On average, cows grazed $31 \pm 5.9\%$ of all available pixels (% GP) for 21 ± 3.7 min (RT), revisited grazed pixels 1.6 ± 0.18 times (RR), and returned to previously grazed pixels after 5 ± 2 days (RI). As PCFA increased, % GP decreased ($r = -0.42$, $P < 0.01$) and pixel re-visits occurred at longer time intervals ($r = 0.73$; $P < 0.01$). Pixel RT and RR were not associated with PCFA; however RT decreased ($r = -0.46$; $P < 0.01$) and RR increased ($r = 0.6$, $P < 0.01$) significantly with increasing CPPT. Cows in this study grazed on average a third of the pixels available to them and visited each grazed pixel more than once. Similar amount of time was spent in each pixel in years with high vs. low PCFA yet in rainy years, cows rotated more rapidly spending less time grazing in each pixel and revisiting grazed pixels a higher number of times.