

Highlights

Rangeland Ecology & Management, May 2011



Grazing Management in Tropical Savannas: Utilization and Rest Strategies to Manipulate Rangeland Condition

Andrew J. Ash, Jeff P. Corfield, John G. McIvor, and Taoufik S. Ksiksi

We studied the influences of utilization rate and resting on vegetation dynamics in the tropical savannas of north-eastern Queensland, Australia. High utilization rates reduced biomass, perennial grass basal area, and ground cover. At high and medium soil-fertility sites, perennial decreaser grasses were largely replaced by exotic perennial grasses, especially at high utilization rates. At low-fertility sites there were no exotic grasses, and the decreaser grasses increased, especially with low utilization or medium utilization plus resting. Either year-round conservative stocking or a grazing system that includes some wet-season resting will help maintain land in desirable condition or improve rangeland condition.

Automated Animal Control: Can Discontinuous Monitoring and Aversive Stimulation Modify Cattle Grazing Behavior?

Jabier Ruiz-Mirazo, Greg J. Bishop-Hurley, and Dave L. Swain

Practical automated animal control or virtual fencing systems require animal-borne devices that use little battery power. We developed software to automatically turn off the devices (control collars) for varying periods of time to save energy. This software was experimentally tested, and cattle were successfully excluded from a preferred area when the collars were turned off for 75% of the time. Turning off the control collars for 75% of the time has the potential to increase four-fold the length of time the batteries will last: from 1 week to 4 weeks in current prototypes.

Impact of Stocking Rate and Rainfall on Sheep Performance in a Desert Steppe

Zhongwu Wang, Shuying Jiao, Guodong Han, Mengli Zhao, Walter D. Willms, Xiyang Hao, Jian'an Wang, Haijun Din, and Kris M. Havstad

Annual variation in rainfall causes large fluctuations in forage production in the Desert Steppe of Inner Mongolia. Basing carrying capacity on production of annual forage species is not sustainable because annuals have little value for winter grazing or for the following year. During the 5 months of high forage production, maximum average daily gain per area was achieved at 0.4 sheep (average weight: 45 lb) per acre per month. However, this stocking rate reduces individual animal gains and may lead to grazing-induced rangeland degradation. We recommend a maximum stocking rate of 0.15 sheep per acre per month to ensure that livestock and grassland production can be sustained.

Forage Quality of Plant Species Consumed by Capybaras (*Hydrochoerus hydrochaeris*) in the Paraná River Delta, Argentina

María J. Corriale, Santiago M. Arias, and Rubén D. Quintana

We compared the nutritional value of plants eaten and avoided by capybaras in the Lower Delta of the Paraná River. Consumed and avoided species had a similar nutritional composition for all the variables analyzed. Nutritional quality was also the same when comparing consumed species, except caloric energy content was higher in preferred species. No differences were found between consumed grasses (Poaceae) and the rest of the consumed plant species. Diet selection by capybaras in this area may be only partially related to nutritional quality, and there must be other factors influencing forage selection.

Effects of Plant Secondary Compounds on Nutritional Carrying Capacity Estimates of a Browsing Ungulate

Steve K. Windels and David G. Hewitt

Nutritional carrying capacity estimates are useful for comparing the ability of various habitats or treatments to support ungulates, but ignoring the negative effects of plant secondary compounds (PSCs) on forage quality may lead to biased estimates. We evaluated the effect of PSCs on nutritional carrying capacity estimates of white-tailed deer in Mexico. Incorporating the effects of PSCs reduced carrying-capacity estimates by up to 50%. Accounting for the negative effects of PSCs in carrying-capacity models is especially important when ungulate diets contain significant amounts of tannin-rich plants or where plant concentrations of PSCs differ greatly between compared sites.

Linking Plant Spatial Patterns and Ecological Processes in Grazed Great Basin Plant Communities

Andrew P. Rayburn and Thomas A. Monaco

Studies of plant patterns often lack a temporal component. We used a global positioning system (GPS) to study the effects of intraspecific interference and grazing on spatial pattern formation in crested wheatgrass stands of different ages (9–57 years), as well as in a 57-year-old grazing enclosure. Our results confirm the importance of fine-scale interference in crested wheatgrass stands, and they also suggest that long-term grazing leads to spatial heterogeneity on a broader scale. Understanding the influence of interference and grazing on plant spatial distribution may help the efforts of managers to increase diversity in crested wheatgrass communities.

Above-Ground Net Primary Production for *Elymus lanceolatus* and *Hesperostipa curtisetata* After a Single Defoliation Event

A. Pantel, J. T. Romo, and Y. Bai

Whether above-ground net primary production (ANPP) for northern wheatgrass (*Elymus lanceolatus*) and western porcupine grass (*Hesperostipa curtisetata*) varies with landform elements and month of defoliation is unknown. ANPP was determined for 2 years after defoliation to a 3-inch stubble height in April through November on five landform elements (north- or south-facing convex or concave slope, and level uplands). ANPP of both grasses was insensitive to landform elements after being defoliated to this intensity. Land managers should consider 1 year of rest following grazing of western porcupine grass in August or September, whereas northern wheatgrass can be grazed annually in any month from April through November.

Allelopathic Cover Crop Prior to Seeding Is More Important Than Subsequent Grazing/Mowing in Grassland Establishment

Daniel G. Milchunas, Mark W. Vandever, Leonard O. Ball, and Skip Hyberg

Grassland establishment during revegetation of Conservation Reserve Program (CRP) and abandoned cropland in arid systems can be limited by competition from weeds that can be costly and difficult to control. Use of an allelopathic cover crop (sorghum) compared to wheat prior to seeding had much greater positive effects on perennial native plant species establishment and suppression of exotic and native weed species than opportunistic grazing or mowing treatments. Cover crops chosen specifically for weed control may be an important management option, but research is limited concerning how climatic, geographic, and plant community conditions may affect responses.

Optimized Frequency Measures for Monitoring Trends in Tallgrass Prairie

Michael D. DeBacker, John S. Heywood, and Lloyd W. Morrison

We present unique analytical tools for evaluating prairie-vegetation monitoring data collected in spatially nested arrays of plots of various sizes. These tools provide land managers with information about trends in the abundance of individual species, aggregate information from individual species to characterize community trends, and measures of overall species richness. Over 5 years of monitoring at the Tallgrass Prairie National Preserve, Kansas, the amplitude (i.e., range) of yearly changes in species abundance was similar from year to year. The trajectory (i.e., direction) of yearly changes, however, was increasing for all years but one.

Comparison of Point Intercept and Image Analysis for Monitoring Rangeland Transects

J. Cagney, S. E. Cox, and D. T. Booth

The SamplePoint trend method uses computer software to classify digital photos. The permanent record associated with the photo-based approach allows for reclassification at any point in the future, to address potential errors or to evaluate photos with different criteria. The reliability of the method was tested by having multiple observers collect data from a single transect on a sandy ecological site in southern Wyoming using both the SamplePoint and Point Intercept methods. Variation among observers was similar for both methods, but the SamplePoint method saved time, and the photo-based approach offers greater long-term advantages.

A Mark-Recapture Technique for Monitoring Feral Swine Populations

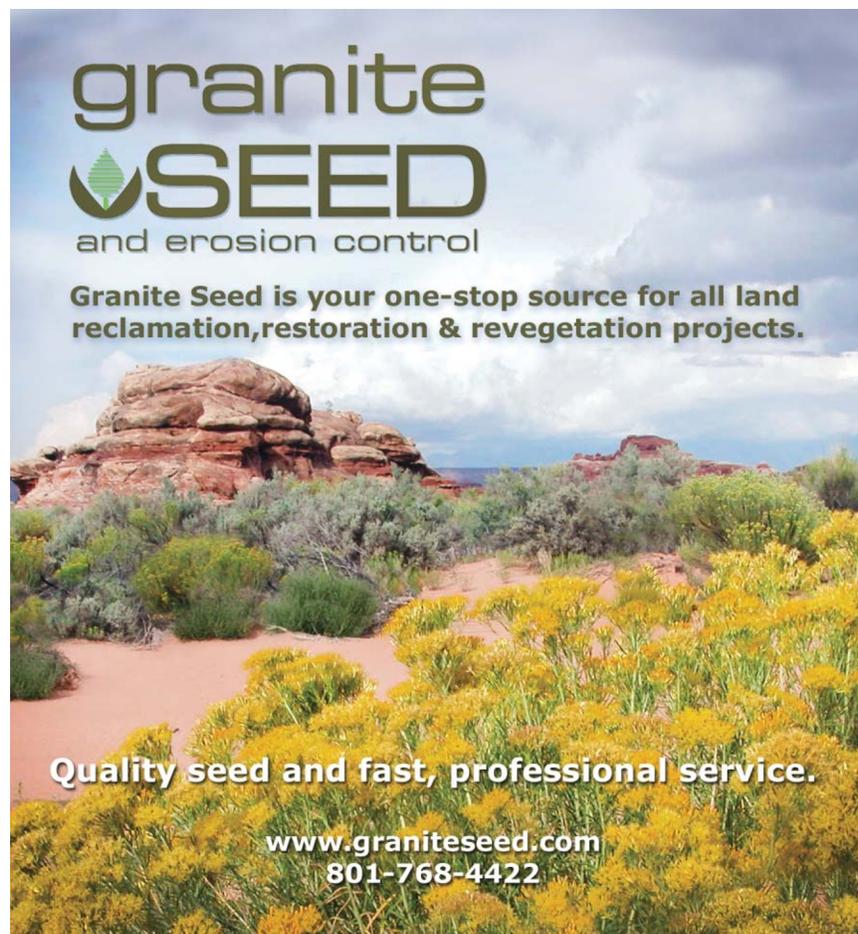
Matthew M. Reidy, Tyler A. Campbell, and David G. Hewitt

Techniques to monitor populations of feral swine (*Sus scrofa*) relative to damage control activities are needed on rangelands. We describe and assess a mark-recapture technique using tetracycline hydrochloride bait stations for monitoring feral swine populations. Use of biomarkers and lethal removal to estimate feral swine populations are appropriate in situations where swine are visible at bait sites and are susceptible to trapping or aerial gunning. This study resulted in removal of 31–43% of the estimated feral swine population in the study areas. Our mark-recapture population monitoring technique would complement programs that manage feral swine populations and damage through lethal control.

Foraging Behavior of *Alberes* Cattle in a Mediterranean Forest Ecosystem

Jordi Bartolomé, Josefina Plaixats, Jesús Piedrafita, Marta Fina, Eduard Adrobau, Aida Aixàs, Marina Bonet, Jordi Grau, and Lluís Polo

The dietary composition of the semi-feral cattle population in the Alberes Natural Park in northeastern Spain was determined from June 2002 to February 2004. The results show that some bovines, such as the *Alberes* cattle breed, can survive year-round in a forest habitat with little forage supplementation. Woody species formed up to 89% of the cattle's winter diet and 33% of the diet even when grassland was utilized. The consumption of a predominantly woody diet would be expected to reduce forest fire hazards.



granite
SEED
and erosion control

Granite Seed is your one-stop source for all land reclamation, restoration & revegetation projects.

Quality seed and fast, professional service.

www.graniteseed.com
801-768-4422