

HIGHLIGHTS

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Perceived Effectiveness of Livestock-Guarding Dogs Placed on Namibian Farms

Laurie L. Marker, Amy J. Dickman,
and David W. Macdonald

Livestock depredation because of wild carnivores can be a substantial problem on farmland, with serious implications both for farmers and for carnivore conservation. We placed Anatolian Shepherd dogs on Namibian farms and surveyed the farmers to evaluate how effective the dogs were as livestock guardians. The farmers reported substantial declines in levels of livestock loss since acquiring a dog, and high levels of satisfaction with the scheme. The information gained during this survey will help guide future livestock-guarding dog projects, and it could have important benefits both for farmers and for large carnivore conservation.

Survivorship and Causes of Mortality for Livestock-Guarding Dogs on Namibian Rangeland

Laurie L. Marker, Amy J. Dickman,
and David W. Macdonald

Using livestock-guarding dogs can be a valuable conflict resolution method, but its effectiveness depends substantially on the longevity of the dogs placed. We examined the survivorship of 143 guarding dogs placed on Namibian farms and assessed the causes of mortality and age at death. On average, dogs placed had a working lifespan of 4.3 years, and accidents were the most common cause of death. Although guarding dogs can be very effective, better care of the dogs and more education of the farmers would make it an even more cost-efficient and successful management tool.

Arizona Permittee and Land Management Agency Employee Attitudes Toward Rangeland Monitoring by Permittees

Maria E. Fernandez-Gimenez, Susan Jorstad
McClaran, and George Ruyle

Land management agencies are increasingly enlisting permittees to monitor their grazing allotments, but little is

known about permittee or agency views of this practice. We surveyed Arizona grazing permittees and land management agency employees to compare their attitudes toward permittee monitoring, Arizona rangeland conditions, government management of rangelands, and the credibility of information sources about rangelands. The 2 groups differed in most of their attitudes, but both agreed that permittees should participate in monitoring their allotments and that collaboration can be beneficial. Joint permittee-agency monitoring may help improve agency-permittee relationships and bridge the gap in attitudes and underlying values.

The Effects of Livestock on California Ground Squirrels (*Spermophilus beecheyi*)

Jeffrey S. Fehmi, Sabrina E. Russo,
and James W. Bartolome

We examined the effects of moderate cattle grazing on the abundance of California ground squirrels (*Spermophilus beecheyi* Richardson) and the spatial distribution of active burrows within their colonies in grassland and blue oak (*Quercus douglasii* Hook. & Arn.) savanna habitats in the coastal range of California, USA. The spatial distribution of burrows did not differ significantly between grazed and ungrazed colonies or between habitats. Thus, low to moderate levels of cattle grazing did not appear to have a strong effect on the population dynamics of California ground squirrels, and grazing may be compatible with maintenance of ground squirrel populations.

Rainfall, Temperature, and Forage Dynamics Affect Nutritional Quality of Desert Mule Deer Forage

Jason P. Marshal, Paul R. Krausman, and Vernon C. Bleich

Forage quality affects physiological condition, population dynamics, habitat use, and distribution of ungulates. We studied how rainfall, temperature, forage biomass, and forage growth were related to water content, crude protein, and digestibility of some common forage species of mule deer in the Sonoran Desert, California. Percent water and protein were greater in forage from plants receiving more rainfall.

Digestibility was greater for forage from rapidly growing plants, and was also affected by temperature and rainfall. These findings suggest that the highest quality landscapes for deer are those with rapidly growing forage plants, where forage water, protein, and digestibility are greatest.

Elk and Mule Deer Diets in North-Central New Mexico

Leonard Sandoval, Jerry Holechek, James Biggs, Raul Valdez, and Dawn VanLeeuwen

Studies evaluating elk and mule deer food habits and competition on woodland rangelands in northern New Mexico are lacking. We determined seasonal diet botanical composition of elk and mule deer, dietary average, and diet variations on woodland rangeland in north-central New Mexico using microhistological analysis of fecal samples. Elk and mule deer shared 3 of the top 5 key forage species. Overall, dietary overlap between mule deer and elk was 64%. Elk are more dietarily adaptable to changing forage availability than mule deer. Our study indicated that mule deer and elk are not complementary on woodland rangelands in New Mexico.

Diets of Prairie Dogs, Goats, and Sheep on a Desert Rangeland

Miguel Mellado, Abundio Olvera, Adrián Quero, and Germán Mendoza

Better information on the foraging ecology and dietary interrelationships among sheep, goats, and prairie dogs would permit the design of better, more sustainable grazing programs. Diets of prairie dogs, goats, and sheep were examined using microhistological fecal analysis during 1 year in northern Mexico. The study showed little difference in diet botanical composition between sheep and prairie dogs, but the overlap in forage resource use between goats and prairie dogs and between goats and sheep was generally low. There appears to be a high potential for grazing goats, along with prairie dogs, to more efficiently harvest the available forage resources.

Consequences of Selecting Rambouillet Ewes for Mountain Big Sagebrush (*Artemisia tridentata* ssp. *vaseyana*) Dietary Preference

Steven S. Seefeldt

Dense sagebrush canopies (> 30%) suppress understory vegetation. Rambouillet ewes with a high or low dietary preference for mountain big sagebrush were tested for their ability to reduce cover of mountain big sagebrush. There was no difference in the reduction of sagebrush canopy between the high- and low-preference ewes; however, ewes with a high preference for mountain big sagebrush consumed more antelope bitterbrush, a desirable shrub, than did low-preference ewes. To help avoid undesirable outcomes from grazing, ani-

mals selected with a diet preference for one plant species must be screened to determine what other plants they will preferentially select.

Spring Growth and Use of Cool-Season Graminoids in the Nebraska Sandhills

Jerry D. Volesky, Walter H. Schacht, Patrick E. Reece, and Timothy J. Vaughn

Upland sites in the Nebraska Sandhills are dominated by warm-season grasses, although cool-season graminoids often produce 10%–40% of the total herbage. A 2-year study was conducted to characterize growth of cool-season species, and determine use and herbage production in response to spring grazing and stocking rates. Total herbage yield in mid-June (1130 kg·ha⁻¹) and mid-August (1350 kg·ha⁻¹) was greatest when paddocks were grazed in April, and declined by about 20% when grazed in May. Overall, upland grazing strategies that include a grazing period in early May will result in greater utilization of cool-season species, but summer yield will be reduced.

Interspecific Competition Interacts With the Spatial Distribution of a Palatable Grass to Reduce Its Recruitment

Pablo A. Cipriotti and Martín R. Aguiar

The possibility of restoring grazed rangelands depends, partially, on the ability of remaining desirable populations to recover. We studied the spatial distribution of remaining palatable grasses in fields with different grazing intensity and quantified the effect of interspecific competition with less palatable grasses on regeneration. The proportion of palatable grasses growing in protected places significantly increased with grazing intensity. But competition effects on regeneration depended on the year's rainfall and less palatable species. We suggest that management for recovering degraded rangelands may benefit from considering the spatial distribution of remaining palatable plants, interactions with less palatable species, and climatic variation.

Silver Sagebrush Community Associations in Southeastern Alberta, Canada

Paul F. Jones, Roy Penniket, Livio Fent, Joel Nicholson, and Barry Adams

Greater sage-grouse (*Centrocercus urophasianus*) habitat in southeastern Alberta, Canada, is limited by the distribution of silver sagebrush (*Artemisia cana* Pursh); however, the community associations of silver sagebrush with soil landscape types are not well understood. Using aerial photography, we classified polygons into 1 of 13 site classes based on soil type and landscape feature and then classified each based on silver sagebrush percent occupancy, density distribution, and height. Silver sagebrush attributes were not uniform between the 13 site

classes. Understanding community associations of silver sagebrush will assist in understanding the resource selection patterns and managing sage-grouse and their habitat in Alberta.

Remote Sensing Assessment of *Paspalum quadrifarium* Grasslands in the Flooding Pampa, Argentina

Lorena P. Herrera, Vanina Gómez Hermida, Gustavo A. Martínez, Pedro Laterra, and Néstor Maceira

The tall-tussock grassland dominated by *Paspalum quadrifarium* ("pajonal") represents the pristine physiognomy of the Flooding Pampa region of Argentina. Mapping remnant stands will aid their management and conservation. We compared 2 classification methods (supervised and unsupervised) using LANDSAT TM images to discriminate the pajonal from other grassland types and land-use patterns. Both classification methods provided very good overall accuracy, but producer's and user's accuracies were better for the unsupervised classification. The unsupervised classification seems a particularly suitable method for mapping complex vegetation units and should be an important tool for management and tracking of future changes.

Fall-Prescribed Burn and Spring-Applied Herbicide Effects on Canada Thistle Control and Soil Seedbank in a Northern Mixed-Grass Prairie

Andrea J. Travnick, Rodney G. Lym, and Chad Prosser

Prescribed burns in Theodore Roosevelt National Park in North Dakota were thought to cause Canada thistle to increase more rapidly than in nonburned areas and perhaps reduce herbicide efficacy. This study showed that Canada thistle did emerge more rapidly in burned compared with nonburned areas, but the effect was short-lived, as indicated by similar weed densities the second season after the burn. Control with herbicides was similar regardless of whether an area was burned prior to application. Thus, current management practices can continue, but reseeding to desirable species is encouraged because more than 80% of seedbank in Canada thistle infestations consisted of undesirable species.

New Mexico Blue Grama Rangeland Response to Dairy Manure Application

Lanson J. Stavast, Terrell T. Baker, April L. Ulery, Robert P. Flynn, M. Karl Wood, and Douglas S. Cram

Dairy cattle produce large quantities of manure every year, resulting in disposal and recycling challenges. It has been suggested that excess dairy manure could be applied to rangelands as an organic fertilizer to increase soil fertility and herbaceous production. We applied light and heavy manure treatments to a blue grama-dominated rangeland in New

Mexico to determine impacts on vegetation. Results indicated that a light manure application rate can increase forb and, in particular, grass standing crop on arid blue grama rangelands. Successful rangeland manure applications will depend on proper management to ensure that objectives are met while minimizing any hazard to the environment.

Research Note: Feeding Value of Singed Walkingstick Cholla

Rachel L. Endecott, Jason E. Sawyer, Clint A. Löest, and Mark K. Petersen

Walkingstick cholla cactus (*Opuntia imbricata* [Haw.] D.C.) has been used in New Mexico as an emergency feed during drought for over 100 years. Most reports present only chemical composition of walkingstick cholla, and limited data exist regarding its feeding value. Treatments consisted of 0%, 15%, and 20% walkingstick cholla in the diet on a dry matter (DM) basis. Dietary organic matter and crude protein digestibilities were similar for all treatments. Because of the poor feeding value and low DM content of walkingstick cholla, its use as an emergency feed should be carefully considered.

Technical Note: A Visual Obstruction Technique for Photo Monitoring of Willow Clumps

Chad S. Boyd and Tony J. Svejcar

At the time of this research, there were no repeatable and reliable techniques for measuring browsing impacts on willows, creating problems for both public and private land managers. We tested a photographic technique for estimating willow biomass and utilization that relied on computer-derived estimates of percent visual obstruction of a photoboard. Results suggest that this technique accurately estimated willow biomass and disappearance of biomass associated with simulated browsing, while minimizing sampling error. Our approach provides managers with a clearly defined tool for monitoring willow biomass and utilization that will be useful in developing grazing systems and adjusting stocking rates.

Technical Note: An Unmanned Aerial Vehicle for Rangeland Photography

Perry J. Hardin and Mark W. Jackson

Because of its perceived impracticality and expense, aerial photography from unmanned aerial vehicles (UAVs) remains virtually unused as a rangeland management tool. A remotely controlled UAV suitable for 35-mm photography was built in 56 hours at a cost of \$1,480. In a 2-year test period, the UAV successfully completed 100+ sorties at elevations ranging from 10 m to 1,000 m above ground. Typical cruise speed during photograph acquisition is 13.8 m/s, resulting in 6.9 mm of blur from forward image motion. The UAV is an inexpensive tool for monitoring rangeland conditions from an aerial perspective. ♦