Rangelands

Society for Range Management

Volume 8, No. 3
June 1986

Elk, Aspen, and Fire in the Greater Yellowstone Ecosystem

Program for the Workshop at the SRM Meeting in Jackson
Monday July 21, 1986

8:00 A.M. MORNING SESSION—Wort Hotel

The Greater Yellowstone Ecosystem—(The Biological and Physical Environment)

The Greater Yellowstone Coalition—(The Political Environment)

Fire in the Greater Yellowstone Ecosystem—Don DeSpain, National Park Service, Yellowstone NP

Elk

Population Biology of the Jackson Elk Herd—Mark Boyce, University of Wyoming, Laramie

Elk Feeding Programs of the Wyoming Game and Fish Department and the Elk Refuge—Tom Toman, Wyoming Game and Fish Dept., Jackson

Aspen

Aspen and Succession—A.A. Beetle, University of Wyoming (emeritus); Jim Whalen and Jeff Weinstein, Wyoming Public Land Commission, Cheyenne.

Role of Diseases in Aspen Mortality—John Hart, Michigan State University

Discussion

1:15 P.M. AFTERNOON FIELD TRIP

Trip to one of the exclosures in the area (Hoback Canyon or Elk Refuge)

(Presentations in the Field)

Importance of Exclosures and the SRM Rangeland Reference Area Program—Barbara Allen, Forest Service (Chairman of SRM Subcommittee on Reference Areas)

History of Exclosures in Jackson Hole area—Webster Jones, Wyoming Game and Fish Department, Cheyenne

History of specific exclosure(s)—A.A. Beetle, U.W.

General Discussion

Special Air Ticketing for Summer Meeting

Western Airlines offers Q rates for travel from July 17th through the 28th, with ticketing due by July 17. As indicated by the ticketing date, they have waived the 30-day advance requirement for Q tickets plus the stay-over of Saturday night. They are not, however, increasing the number of Q fares available on any flights and still have the 25% cancellation fee for tickets issued and then cancelled.

Arrangements may be made by the traveler directly with Western Airlines or through a travel agent. Telephone Western Seattle convention desk: 1-800-426-5249; in Washington State 1-800-562-5070. The shell number is BSE059.

SOCIETY FOR RANGE MANAGEMENT

THE TRAIL BOSS

The **Society for Range Management**, founded in 1948 as the *American Society of Range Management*, is a nonprofit association incorporated under the laws of the State of Wyoming. It is recognized exempt from Federal income tax, as a scientific and educational organization, under the provisions of Section 501(c)(3) of the Internal Revenue Code, and also is classed as a public foundation as described in Section 509(a)(2) of the Code. The name of the Society was changed in 1971 by amendment of the Articles of Incorporation.

The objectives for which the corporation is established are:

—to develop an understanding of range ecosystems and of the principles applicable to and the management of range resources;

—to assist all who work with range resources to keep abreast of new findings and techniques in the science and art of range management;

—to improve the effectiveness of range management to obtain from range resources the products and values necessary for man's welfare;

—to create a public appreciation of the economic and social benefits to be obtained from the range environment;

—to promote professional development of its members.

Membership in the Society for Range Management is open to anyone engaged in or interested in any aspect of the study, management, or use of rangelands. Please contact the Executive Vice-President for details.

Contribution Policy

The Society for Range Management may accept donations of real and/or personal property, subject to limitations imposed by State and Federal Law. All donations shall be subject to control by the Board of Directors and their discretion in utilization and application of said donations. However, consideration may be given to the donor's wishes concerning which particular fund account and/or accounts the contribution would be applied.

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Rangelands serves as a forum for the presentation and discussion of facts, ideas, and philosophies pertaining to the study, management, and use of rangelands and their several resources. Accordingly, all material published herein is signed and reflects the individual views of the authors and is not necessarily an official position of the Society. Manuscripts from any source—nonmembers as well as members—are welcome and will be given every consideration by the editors. **Rangelands** is the nontechnical counterpart of the **Journal of Range Management;** therefore, manuscripts and news items submitted for publication in **Rangelands** should be a nontechnical nature and germane to the broad field of range management. Editorial comment by an individual is also welcome and subject to acceptance by the editor, will be published as a "Viewpoint."

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COVER: Goat shearing in September 1985 on part of the Harrison Ranch near Brackettville, Texas. Photo by Tony Huffman

A New View for Resource Managers

Robert H. Haas

Introduction

In decades past, the rancher depended upon reports from cowboys to gather information he needed to make management decisions. Today, the vast open ranges of the cowboy era are mostly gone in the United States—fenced into pastures, paddocks, or fields that are now discrete management units. But fencing in the rangeland, while it has replaced much of the need for cowboys, has not replaced the need for information about the health and vigor of the forage on each parcel of land.

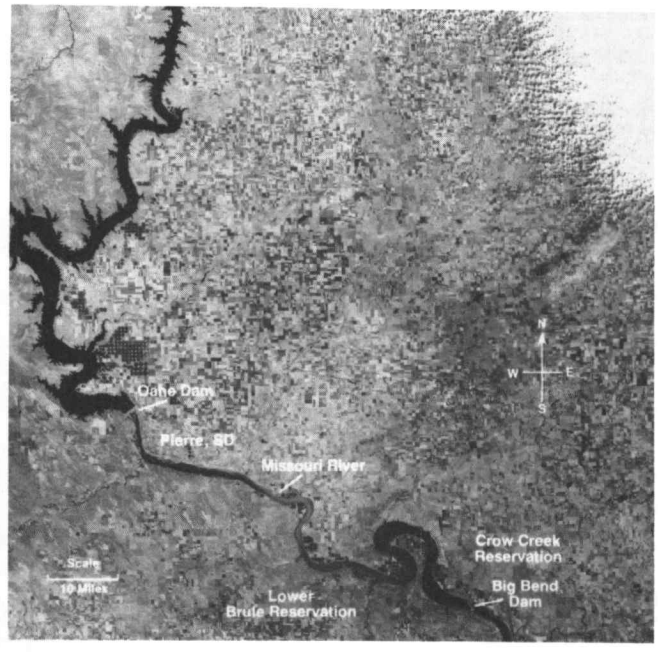
Can a satellite, orbiting at more than 400 miles in space, serve this purpose?

As ranchers and resource specialists are asked to make more and more complex management decisions, with less manpower for conducting inventories, they are wise to seek help in today's rapidly developing technologies. For the past few decades the range technician has accomplished most of his range assessment from a pickup truck, traveling periodically to each unit to determine its status. Now, satellite images of the Earth's resources might be able to help the modern range person do an even more efficient job of monitoring the availability of feed for livestock and wildlife. Yet some important questions need to be answered first. Can this new information source be used to evaluate the ecological condition of these lands? Or are satellite images of our Earth and its variety of landscapes just "pretty pictures," with little practical utility?

Resource Satellites

A series of five Earth resources satellites, known as Landsat, have collected more than 2,000,000 images of the world's landscapes since 1972. Today, Landsat 5 treks around the Earth with a potential for imaging the world's resources about every two weeks (16 days). Landsat's electronic sensors record the energy reflected from objects on the ground below its orbital track, producing images that cover an area approximately 100 miles square along each orbital path. The multispectral scanners (MSS), which have been aboard the five Landsat missions since 1972, look at an area as small as one acre. New instruments on Landsats 4 and 5, called thematic mapper (TM), have a resolution about five times better than this and can image an area as small as some gardens.

Another source of satellite data for resource monitoring is from the National Oceanic and Atmospheric Administration's (NOAA) weather satellites. They image the Earth every day, monitoring both the visible and infrared spectrum. The Advanced Very High Resolution Radiometer data from the weather satellites have a coarser ground resolution than Landsat, but summaries of the data are available on a worldwide basis every week.



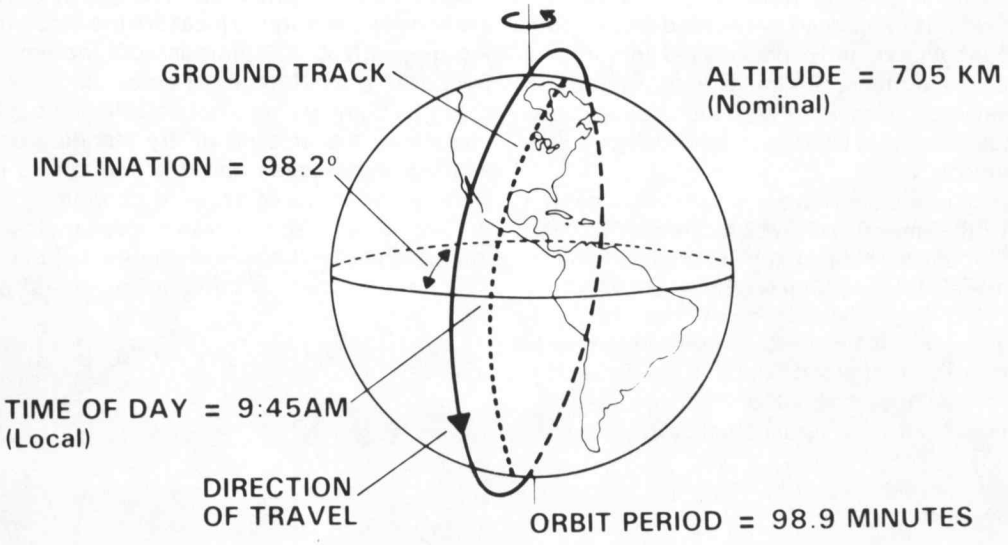
Landsat 5 scene showing rangeland and cultivated crops along the Missouri River in central South Dakota from near Chamberlain to Pierre and includes: the Lower Brule and Crow Creek Indian Reservations, Big Bend Dam, and the City of Pierre and Oahe Dam, all along the Missouri River.

Satellite Data Products and Their Uses

An understanding of how satellite data can be used begins by considering that each picture element, or pixel, in a Landsat MSS scene represents an area of about 1.1 acres. In contrast, a Landsat TM pixel covers less than 0.2 acres, while the much coarser weather satellite pixel would cover an area of about 250 acres. Obviously, no such images would let you count the number of mesquite bushes in the back horse trap. Yet, many landscape features, including large rivers and lakes, mountain ranges, deserts, cultivated areas, rangelands, and forests are observable, even with the coarse resolution of the weather satellite images.

For rangelands, large-area monitoring is generally the name of the game. It is estimated that about 45 percent of the Earth's land surface is best used as rangeland, and conventional measurement approaches simply will not suffice for most applications. To follow deteriorating range conditions due to drought and desertification, regional monitoring is necessary. In many cases this can be done only with synoptic, large-area coverage provided by satellites.

Author is with Technicolor Government Services, Inc. Work performed under U.S. Geological Survey contract 14-08-0001-20129.
Publication authorized by the Director, U.S. Geological Survey, on June 10, 1985.



Thematic mapper and multispectral scanner sensors on Landsat 5 are in a position to take repetitive coverage of the Earth's surface every 16 days. Major orbital characteristics are shown above.

Rangeland areas are most often relatively arid regions. Consequently, cloud cover is not the problem for satellite remote sensing of rangelands that it is for some other applications of satellite imagery (such as over humid forest regions). Satellite images of rangelands can thus be acquired at critical times in most years. The time of acquisition is very important because the images recorded by Landsat during dormant or very dry periods show little contrast. In temperate climes, the most useful information for rangeland assessment seems to be from scenes taken near the end of the growing season. It is at this time of year that grasslands best show the degree of use, or conversely, the amount of standing crop remaining. In many ways, satellite-acquired data seem ideally suited for rangeland study.

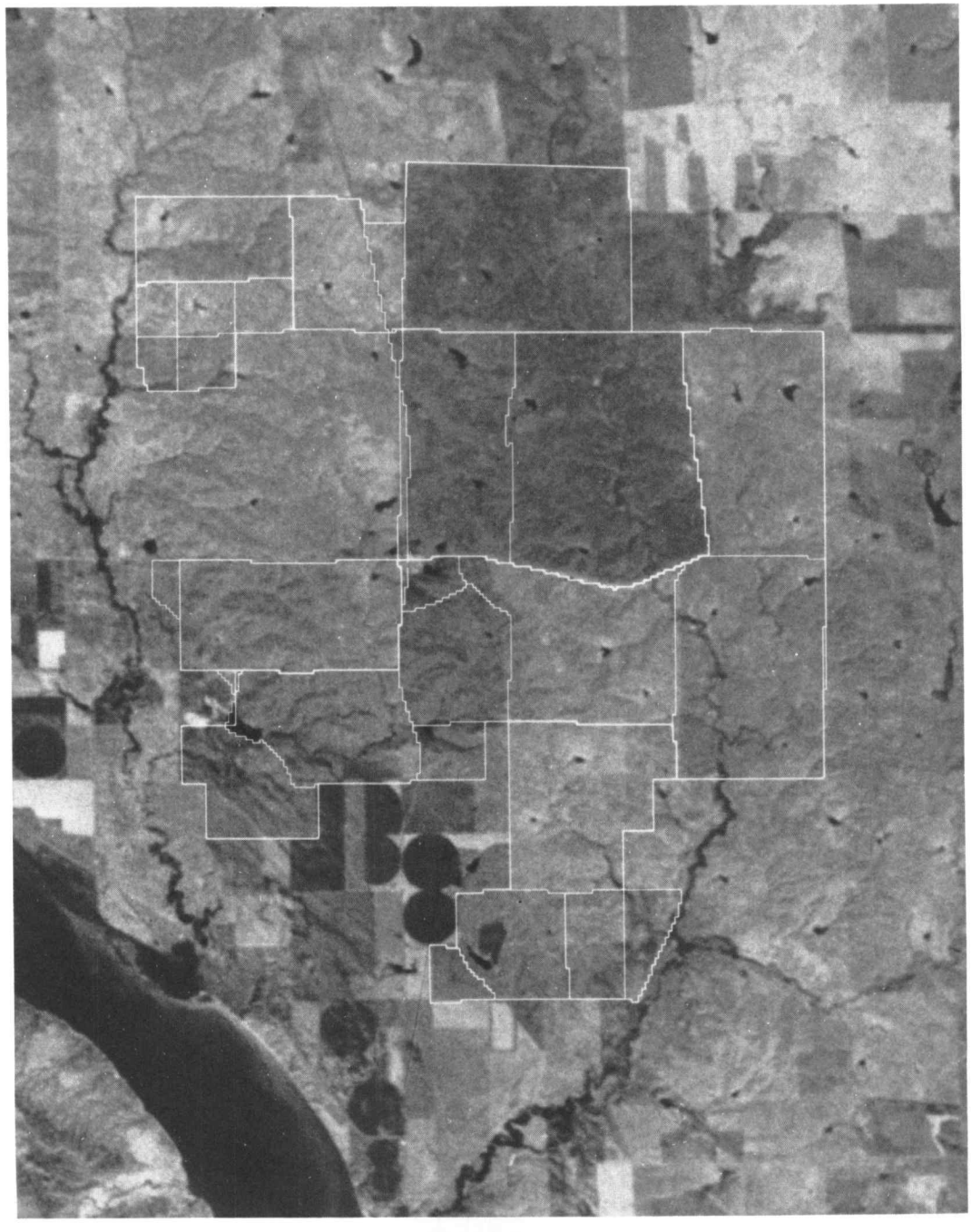
Apart from the spatial and temporal characteristics that make satellite images potentially useful, there is a good deal of spectral information in every scene. Analysis of MSS data indicates that scene brightness and the greenness of the

Brightness differences on rangelands in the September 12, 1984, Landsat TM images from Buffalo County, S. Dak., are directly related to the degree of use within pastures. White outline indicates study area included in following scene.

vegetation cover explain more than 95 percent of the reflectance variation in most Landsat MSS rangeland scenes. Brightness (or albedo) is influenced by the kind and amount of cover, the amount of litter, and especially the amount and kind of exposed soil surface. On most soils brightness increases with heavy use, or as range condition deteriorates. Therefore, brightness can be used to monitor serious erosion or vegetation loss.

Several indexes of greenness have been shown to be well correlated with ground-measured green biomass. All of the greenness indexes contrast reflectance in the red and near-infrared spectral bands. When weather satellite data are used this way the relative greenness of vegetation cover can be monitored continent-wide. The "green vegetation" indexes are sensitive enough to measure the amount of green standing crop in 250-300 pounds/acre increments, up to 3,000 pounds of green forage per acre.

At this point we have not established a reliable means for measuring the amount of dry standing crop with remote sensing. It has been possible, though, to monitor "greenness" as an index of growing conditions and to relate the duration of favorable growth to a volumetric accumulation of annual grasses. It has been suggested that greenness may also be a worthwhile indicator of the nutritional status of



An enlargement of the Landsat TM image (see preceding scene) showing brightness differences by pastures and grazing distribution patterns within pastures for a selected area in Buffalo County, S. Dak. White lines in computer generated overlay are pasture boundaries in a study area.

range forage.

Strategies for Future Use of Satellite Data

Landsat MSS and TM data both have adequate resolution to aid in most area-wide and regional vegetation and soils inventories. These data can be used in computer-aided analyses or can be manually interpreted to define important plant community boundaries. Much care must still be taken in characterizing range sites, and field sampling is essential for compiling reliable maps of the vegetation resources. Since vegetation boundaries often follow changes in soils closely, remote sensing data can also aid soil surveys on naturally vegetated range. Recent demonstrations have shown, in fact, that weather satellite data can be used to conduct continent-wide vegetation surveys.

We have tried, with mixed success, to use satellite data to accomplish conventional range management tasks. But since we usually cannot determine species composition with satellite sensors, some resource technicians have rejected satellite MSS data as a valid source of information. This rejection probably indicates that we need to examine the sanctity of our measurement concepts, as well as the information content of satellite images. Is species composition the only usable measure of the ecological status of a site?

In the past we have not always had a synoptic view of the site being evaluated; thus, we relied heavily on species composition data collected at sample points on the ground to determine the pattern of vegetation distribution. Satellite spectral data have provided the analyst with a new and powerful tool for mapping the boundaries of plant communities that may occur repeatedly across a landscape. Once the cover type boundaries are established, species composition may be inferred from the spectral data or determined from field sample measurements. Spectral data, even when collected by a distant satellite, may be able to provide more sensitive indicators of ecological trends than is possible to obtain by analyzing species composition alone. There is a need to document the ecological trends affected by management and weather and to relate them to associated changes in spectral reflectance. Using the satellite data as an aid in evaluating the ecological status of range vegetation holds much promise for efficient, long-term monitoring and documenting of range ecosystems conditions.

Satellite data have the potential for monitoring range condition trends on a pasture-by-pasture basis, and for helping the range manager to observe grazing distribution problems. On a regional basis, it is now possible to use greenness assessment to supplement regional range feed condition reports. Quick-look capabilities and long-term change detection can be used for many tasks on any area covered by a spatial data base that includes the satellite data. On a worldwide basis, weather satellite data are being used to monitor vegetation greenness weekly. Currently, the information is too coarse to assist range managers, but it seems usable for monitoring drought and even regional desertification. More intensive use of data from the earth resource and weather satellites could make the monitoring of range resources more effective on a local, regional, and even countrywide basis.

The potential for effective use of satellite data in range resource management must be realized in the administrative and managerial echelons if support is to be obtained for the research needed to make these new information sources available and usable. Resource specialists and ranchers, for their part, must undertake the training they will need to make the applications of these data pay off in terms of better forage resources and more profitable use of the range for all. It seems almost certain that the increasing pressures for efficiency that are being brought to bear on land management operations everywhere will be aided by the new view of range resources available from Earth resource satellites. ●

The 1080 Livestock Protection Collar for Predator Control

Jerry H. Scrivner and Dale A. Wade

The Environmental Protection Agency (EPA) granted the U.S. Fish and Wildlife Service (USFWS) registration of the 1080 Livestock Protection (LP) Collar for restricted use in predator control in July 1985. The LP collar is designed to kill coyotes that attack sheep and goats. When coyotes attack the throats of collared animals, they usually puncture toxicant-filled pouches on the collar and receive a lethal dose of the toxicant (Compound 1080).

Properly fitted Livestock Protection Collar on a 35-pound Spanish/Angora kid.

Past Use of the LP Collar

The LP collar was designed by Roy McBride of Alpine, Texas. In 1974, the USFWS patented the collar in McBride's name in return for which McBride granted royalty-free use of the collar to the U.S. Government (Connolly 1980). Connolly (1980) reviewed the USFWS involvement with the LP collar. In 1974-75, staff from the Denver Wildlife Research Center conducted pen and field tests using collars filled with sodium cyanide. While the cyanide collar proved effective against captive coyotes, it was ineffective against wild coyotes, possibly because of the repellent properties of the toxicant.

In 1976, the Denver Wildlife Research Center tested collars containing diaphacinone in pen and field operations. These collars were effective in pen trials, but in the field trials coyotes often continued to kill sheep during the period (6-16 days) between dosing and death; therefore, a faster-reacting toxicant was sought.

In 1978, the Denver Wildlife Research Center began field tests with 1080 in the LP collar in Montana, Idaho, and Texas. From the results of 21 tests, Connolly (1979) concluded that the collar was effective in taking problem coyotes and recommended that the USFWS seek registration for Compound 1080 for operational use in the LP collar.

In 1979, collars were used at 7 test sites in Montana, Idaho, and Alberta; however, by late 1979 all collars were withdrawn from the field except at 3 test sites near Meridian, Texas. During 1979, the Denver Wildlife Research Center devoted more effort to assessment of primary and secondary hazards of collar use.

Although the collar was beginning to receive favorable publicity, USFWS research on the collar was hampered when, on 8 November 1979 (Andrus 1979) and 15 January 1980 (Andrus 1980), Secretary of the Interior Cecil Andrus stated that "there will be no further research or development of potential uses of Compound 1080" by the Department of Interior (USDI) on lands administered by the USDI. However, the Secretary also emphasized that research should be continued "on toxicants displaying species specific characteristics and delivery systems which use patterns that are selective for target individuals" (Andrus 1979).

In response to the statements by Andrus, the Western Regional Research Coordinating Committee (1980) stated that "there is no known compound which is as selective and has such a significant research base as Compound 1080" and that the Committee "strongly supports research, development and use of Compound 1080, until more selective, safer, and efficient toxicants are available." The Committee further stated that "the toxic collar . . is without question one of the most selective methods where it can be applied to remove killer coyotes preying on sheep and goats."

Evaluation of Collars

Secretary of the Interior Andrus initially contacted the Texas A&M University System on 6 May 1980 and inquired whether the University was interested in participation with the USDI in a cooperative research effort on the efficiency and safety of 1080 in the LP collar as a predator control

Jerry Scrivner was a graduate research assistant at Texas A&M University when the research took place; he is now postdoctoral researcher at the University of California Hopland Field Station, 4070 University Road, Hopland, California 95449; Dale Wade is Extension wildlife specialist, Texas Agricultural Extension Service 7887 N. Hwy. 87, San Angelo, Texas 76901.

The authors acknowledge the Texas Department of Agriculture, Texas Rodent and Predatory Animal Control Service, Texas Agricultural Experiment Station, and Texas Agricultural Extension Service for contributing to this study in various ways. The research was funded in part from a grant from the U.S. Fish and Wildlife Service, Denver, Wildlife Research Center, Cooperative Agreement No. 14-16-0009-81-934.

Requests for reprints of this paper should be addressed to Dale Wade.

method. Texas A&M's reply was in the affirmative and the University's application to the EPA for an Experimental Use Permit to conduct field studies with the 1080 LP collar was approved.

The EPA permit allowed the University use of Compound 1080 on as many as 20 test sites; 14 were subsequently selected. The test sites were identified through direct contact with ranchers, Texas Department of Agriculture, and Texas Rodent and Predatory Animal Control Service personnel. The Texas Department of Agriculture and the University cooperated in selecting suitable sites. Ranchers were selected according to severity of coyote predation, the history of predation, and husbandry practices.

Two methods of data collection were used. One method depended on cooperating ranchers as principal data collectors. Information on the efficacy and safety of the 1080 LP collar was recorded for use by University personnel. This phase of the study was primarily "extensive" in nature, because University personnel were not involved in day-to-day use of the collars and in data collection. Thirteen ranches were involved in this portion of the project.

The second phase of the project was more "intensive" in nature. A graduate research assistant or technician resided at the cooperating ranch and was directly involved with most events related to collar use. This included, but was not limited to, collar application, herd manipulation, animal searches, and data collection.

At the beginning of each test, personnel from the Texas A&M and the Texas Department of Agriculture met with each rancher individually to review requirements for participation in the cooperative collar-use project. Toxicity of Compound 1080 and potential hazards of its use were reviewed and discussed. Ranchers were instructed on correct collar use in order to direct attacking coyotes to collared animals; however, since each rancher was confronted with different problems, some flexibility was employed in adjusting methods to suit each situation. University personnel filled collars with a specific concentration of toxic solution and provided these to the ranchers. Ranchers purchased the collars and paid for other normal operating expenses, including use of animals and management required for the test.

Generally, the collars were found to be an effective method for use in conjunction with other control measures. Three methods of targeting depredating coyotes to collared animals were most effective. One method involved placing a small herd of collared animals in a pasture prior (at least several weeks) to introducing uncollared animals. Another method involved placing a few collared subadults in a herd of uncollared adults. The third method involved the nightly release of a small flock of collared animals into a pasture in which predation on uncollared animals had occurred.

Whichever target strategy was employed, efforts were made to isolate the target flock from nearby uncollared animals which might serve as alternate prey. When nontarget livestock were not isolated, the effectiveness of targeting was greatly reduced. For example, due to a lack of available pasture, one rancher placed a few collared lambs with a large number of uncollared ewes and lambs. The probability of coyotes attacking collared animals was significantly reduced and a number of uncollared animals were killed for each collared animal killed.

The primary factors limiting collar effectiveness were the following: (1) coyotes attacked livestock elsewhere than at the throat, (2) damaged or lost collars due to wires, thorns and other objects, and (3) collars pulled out of position by brush or other objects.

A researcher demonstrates the use of supplemental feed to examine collared Angora goats in a target flock pasture.

Cost of Collar Use

From February 1981 to November 1982, data regarding cost of collar use was gathered on 12 of the ranch sites (Table 1). During this time, ranchers used the collars for an average of 30 weeks. Herd size on all ranches varied during the study but averaged about 600 head.

Table 1. Average costs resulting from use of 1080 Livestock Protection Collars on 12 ranches in Texas. Collars were on livestock for an average of 30 weeks.

	Average no. per ranch	Value per unit ($)	Value per ranch ($)
Collared animals killed or missing	5 head	32.00/head	160
Collars punctured or missing	7 collars	18.00/collar	126
Transportation	475 miles	0.2253/mile	107
Labor	162 hours	3.65/hour	591
Feed	—	—	81
Miscellaneous[1]	—	—	19
Total			1,084

[1]This includes a lock box to contain collars, ear tags for collared animals, ear tag applicators, and warning signs. These costs were estimated by the authors.

Because of the experimental nature of these LP collar projects, some costs were probably higher than would be the case where collars are registered for general use. Cooperating ranchers generally recognized the need to gather reliable data regarding collar use and efficacy and therefore probably spent more time working with collared livestock than would be spent under normal field use.

The need to expose collared animals in order to take depredating coyotes is essential and most are sacrificed, this is generally considered a disadvantage of using collars. However, it can also be argued that the loss of collared animals may represent no additional cost to ranchers, because some animals will be killed whether or not they are collared if coyotes enter a pasture to kill livestock.

A collared 25-pound Angora kid killed and fed upon by a coyote.

In addition to the collared livestock killed by coyotes, another cost was that of the collars, which were about $18.00 each. Ranchers purchased an average of 19 collars each.

At times, labor costs were also significant; this primarily involved periodic checking and adjusting of collars and managing livestock to direct predation toward collared animals. Adjusting collars was particularly important on young, growing animals to prevent collars from becoming too tight. Labor also included gathering animals specifically for application or removal of collars. This often required considerable time but was usually done infrequently enough to account for a relatively small part of the total labor required. Labor requirements were reduced by handling collared livestock during periods when they were gathered for other purposes such as shearing or drenching.

Supplemental feed for collared livestock was an additional cost. As a rule, corn or a protein supplement were used to attract collared animals to permit examination of collars and the animals. Occasionally, livestock were fed during periods when they were penned for observation to assure that collars were properly fitted.

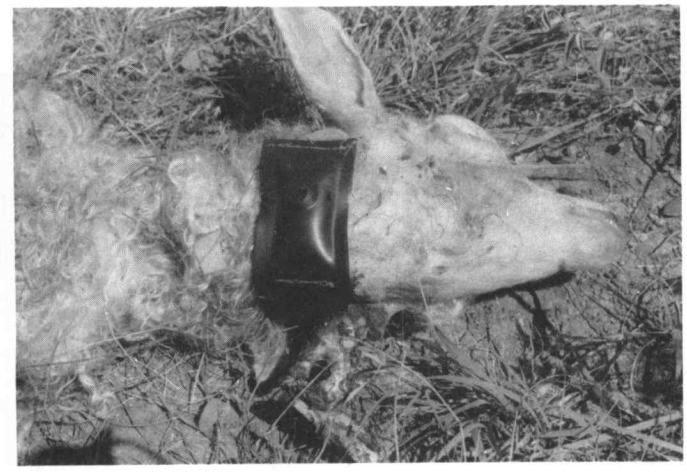
Minor miscellaneous costs included purchase of lock boxes to contain collars, ear tags for collared animals, ear tag applicators, and warning signs regarding collar use for posting entrances to test sites.

Of 11 ranchers questioned regarding the cost effectiveness of the LP collar, 8 thought the collar was cost effective, 2 did not, and 1 was uncertain (1 of the 12 ranchers did not respond to this specific question). It was concluded that the LP collars were probably cost effective when predation was a consistent problem. They also may be cost effective at low predation levels if their use is limited to periods when predation occurs.

Conclusions

Based on these tests and other research, 1080 LP collars deserve further consideration for use in predation control. However, the use of collars is not a solution to coyote predation on sheep and goats. Instead, collars offer an additional tool which may be used with other control methods to help alleviate losses.

The ability to manage livestock to direct predation at collared animals as well as the history of predation losses should be examined for each case to determine the potential



This close-up view shows that the right collar packet was not punctured by the coyote's teeth, despite the collar being in the correct position. Tooth punctures were made ahead of the collar.

However, the left packet on the collar was punctured by the coyote's teeth and, presumably, the coyote died, since coyote kills in the goat herd ceased for a time.

utility of collars. If predation is severe and if livestock can be managed to direct predation at collared animals, collars can be a safe, cost-effective control tool.

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Viewpoint: Vehicular Recreation Use on Public Lands

Stu Bengson

Vehicular recreation, commonly referred to as off road vehicle (ORV), use of public lands is a very 'hot' issue these days. Discussions of public land management invariably focus on "ORV impacts" with heated conversation of the pro's and con's.

What is vehicular recreation? Vehicular recreation, unheard of prior to the 1960's, is the fastest growing form of outdoor recreation in America. In 1976 there were an estimated 5 million ORV motorcycles, 2.8 million 4WD's, more than 2.2 million snowmobiles, and 250,000 "dune buggies." Total sales of these vehicles in the past 7 years were in excess of 12 million. It is estimated that 4 out of 5, 4 × 4 owners will use their vehicles occasionally for outdoor recreational purposes. Overall, in 1977, there were some 43.6 million Americans (25% of the total recreational public) involved in vehicular recreation with as much as 40% of this total in four-wheeling.

All these vehicular recreationists need somewhere to go, which leads to recreational use of the public lands. This creates a very high demand on some areas and presents the land use manager with various management problems and conflicts. The center of the controversy over OVR use on public lands is "environmental impacts." Without question, the unmanaged, unregulated use of the public lands by recreational vehicles has caused much damage to some areas. There are other examples where well-managed and regulated OVR use can be accommodated. One study showed that more than 60% of the public had no objections to 4-wheel drive or ORV use in a specific area. Another study showed that only 4% of the public objected to ORV uses.

Everyone involved with the "ORV controversy" has read or heard of the many reports, texts, etc., that have "documented" the severe impacts of ORV use. Sheridan & Carroll's 1979 CEQ Report and Webb & Wilshires 1983 book on "ORV Management" are prime examples of the 'biased' information that is presently being used to develop management and policy strategies for vehicular recreation. What is needed are some **real** unbiased, studies on the true impacts, needs and problems of recreational vehicle use on public lands.

One solution is the proper management with reasonable and practical regulation. Vehicular recreation is here to stay and will continue to grow. Closing one area only shifts the problem to other unregulated and unmanaged areas. Many areas of the West have documented hundreds of thousands of ORV recreational visitor days use. Proper ORV use in an area can be a benefit. It is not uncommon for a major "ORV event" to draw 18,000 visitors and generate $125,000 in revenue. Vehicle recreation accounts for about $28 million annual revenue in one economically depressed area in Colorado. A 1984 California study placed ORV values at $45/person/day. Total ORV recreation in California in 1985 was estimated at over 52 million visitor days which would equal $2.3 billion.

One study shows that only 2% of the recreational lands are designated for ORV use. A National Park Service study showed that 7% of the recreational use was with ORVs while 3% was hiking. A 1985 Forest Service study shows that 29% of the recreational use was motorized while only 7% was backpacking. A 1985 BLM study shows that 57% of the recreational use is ORV related. Only 10 states have any kind of ORV management plan and only 19 states have designated ORV areas. Some of the biggest problems with proper ORV management are inadequate funds, user conflicts, and misuse of the land.

There is an increasing appetite for more "wilderness" areas. At present, about 27% (some 188 million acres) of the Federal public recreational lands are classed or being managed as some form of wilderness area—closed to vehicular recreation. Since 1984, an additional 6 million acres of new Wilderness lands have been legislated. These closures remove thousands of miles of motorized trails from vehicular recreational use. Today there are over 350 designated "National Recreational Trails" totaling 105,000 miles, only 98

Editor's Note: Author is a Director, Land-Use United Four Wheel Drive Associations of U.S. and Canada; 2nd Vice-President, Outdoors Unlimited Inc.; and Director, Arizona Outdoor Coalition.

miles of which are designated as motorized recreational trails. It is not the 'acres' of open ORV areas that is important. It is the miles of roads accessible that are important to vehicular recreationists. Most vehicular recreationists do not want unroaded pristine wilderness areas opened up by bulldozing new roads for motorized use. They want existing 'roaded' areas left for 'semi-primitive motorized' recreational use.

Except for some designated "play" areas such as beaches, dunes, etc., ORV use is confined to "existing and designated roadways." Off-road vehicle use involves leaving the paved, improved roads for access to the public lands to hunt, fish, sightsee, or access wilderness and hiking trials. Approximately 60% of vehicular recreationists are family groups using their vehicles to get close to nature.

This dedicated attitude is reflected by vehicular recreationists' willingness to volunteer their time and efforts to protect, improve, and enhance the natural resource areas. In these days of extremely constrained budgets, this becomes a major economic factor for land management agencies. In 1984, 42,000 volunteers working the National Forests accomplished $15 million worth of work. Much of this work is done by vehicular recreationists. A recent study indicated that more than 156,000 manhours have been donated by vehicular recreationists. In the past 2 years, over 48,000 manhours have been volunteered to programs such as "Adopt-A-Trail" and "Forest Watch." Vehicular recreationists are involved in other volunteer programs such as litter patrols, reforestation, historical restoration, fencing and wildlife habitat improvement.

Vehicular recreationists make up a large portion of the American recreational public. Just because a very few "ORV" recreationists are natural resource *vandals* and *bandits,* disobeying rules, regulations and common sense, does not mean that all ORV recreationists should be punished and banned from public lands. This would be equivalent to closing all highways because some drivers exceed 55 MPH.

Vehicular recreationists are not opposed to fair regulation and will support 'special registration and fees' within reasonable and logical limits, if the fees are used to further enhance the resources of the ORV use areas. All user groups should be fairly 'taxed' for the use of the recreational areas. Arbitrary regulation and inequitable fee structuring to the detriment of vehicle recreationists to subsidize and favor other recreational groups is unjust.

Local ORV recreational groups are anxious to develop satisfactory and agreeable land management plans and regulations. All it takes is a little cooperative effort on the part of all interested parties. This would reduce the controversy and problems of vehicular recreational use on public lands.

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Viewpoint: Off-Road Vehicle Damage to Public Lands

Sid Goodloe

Lack of understanding of the fragility our Western range and forest lands combined with unenforced regulations have resulted in serious damage to our public lands by off-road vehicles (ORVs). In Wyoming alone 75% of the public lands are impacted by ORV use. Anyone who has driven across southern California in the last few years can attest to the numbers of ORV's using public lands there.

There are more than 400 million acres of public lands in the United States. These include watersheds affecting rivers, streams, lakes, and underground water supplies that are vital to all of us. Although legislation guarantees the public a right of access to these priceless lands, the framers of such legislation did not intend, I believe, for **use** to constitute **misuse.**

In the past 30 years, ORV traffic on public lands has gone from almost none at all to overwhelming. While other uses such as timber and fuel wood harvest, energy exploration, grazing and game harvest have reasonably adequate restrictions, regulations for ORV use on these lands go virtually unenforced.

Over 6 million 4-wheel-drive vehicles were built and sold by American auto makers during the past decade. Many of these vehicles, plus uncounted Japanese 4 × 4's, dirt bikes and three-wheelers, are being driven on public lands causing erosion, asthetic deterioration and wildlife habitat damage.

Despite Executive Order 11644 signed by President Nixon on February 8, 1972, off-road vehicles are basically uncontrolled while using our public lands. This Executive Order requires Federal agencies to develop regulations and procedures for control of ORVs on public lands to minimize resource damage. In 1977, yet another Executive Order (11989) issued by

President Carter gave public land managers the authority to immediately close areas and trails where ORV's were causing considerable adverse effects. We have regulations, but only minimal enforcement by public land managers who are slow to grapple with the problem.

Off-road vehicle users pay no fees for the use of public lands. The current administration, aware of this fee discrepancy, has directed our public land agencies to recover a minimum of 25 percent of the costs to the taxpayer of providing recreation on public lands.

Much has been said about the taxpayer subsidizing the livestock industry because grazing fees on public lands are lower than on private land. Grazing fees *are* paid, however, and regulations enforced. It seems rather inconsistent that ORV users are paying no fees to use our public lands and at the same time are damaging the resource.

Conservationists, environmentalists, graziers, sportsmen and sportswomen, public land managers, and others express concern over growing ORV use on public lands. They are frustrated in their attempts to halt the environmental destruction that is obviously accelerating. It is not easy to watch a vehicle grind up a muddy hill when you know a gully will appear after the first heavy shower.

Television and other media advertisements create the impression that ORV's are built to conquer any terrain. The only concern evident is the vehicle's ability to perform. No mention is made of using discretion or common sense as to where those vehicles are driven. In Arizona ORV users, stimulated by a nationally broadcast televison ad depicting a Nissan truck destroying a ghost town, have begun to search out historical artifacts and archeological remnants for the same treatment. *Arizona Highways* magazine, an official publication of the Arizona Highway Department, has discontinued publishing locations of Arizona's historic mining sites because ORV damage has become a major concern.

Some public lands have deteriorated to a state of accelerated erosion. In most of the Western states, U.S. Forest Service land is generally higher in elevation than private land. Silt from erosion of these lands, in many cases, is deposited on privately owned land. Other areas have been disturbed to the point that vegetative cover is gone, and erosion from wind and water will begin if uncontrolled traffic continues.

Erosion of this magnitude not only depletes the public land but produces silt that affects the habitat of fish and other wildlife, destroys stock and wildlife watering ponds, can clog irrigation systems, and can harm downstream crops and hay lands. Exposed soil increases storm water runoff rates and contributes to flooding and related damages. Soil erosion is not a local problem; it has widespread and costly consequences, many of which will last for decades—or longer.

In California's Dove Springs Canyon, after 10 years of use, ORV's had denuded 543 acres and heavily damaged another 960 acres. The Panoche Hills area was losing 6,400 tons of soil per square kilometer, 26 times the S.C.S. tolerance level. In the eastern Mojave, tracks made by General Patton's tanks over 40 years ago are still clearly visible, and will be for centuries to come.

Recreation must be managed. Motorized recreationists cannot continue to have license to choose whatever terrain they want to use. Some states have begun to accept the responsibility of protecting their own lands. The state of Washington generally prohibits cross-country ORV or snowmobile traffic on the 5 million acres of state-owned land and provides a special facilities such as abandoned gravel pits and roads paid for by ORV recreationists. Indiana has banned ORV's from all state lands since 1972.

In New Mexico, ORV damage to public lands reached the point where the State Department of Game and Fish, by authority of the State Legislature, is now issuing citations for off-road vehicular traffic on public lands during hunting season. This effort to overcome the lack of enforcement of ORV regulations on public lands has had some beneficial effect, but, without total commitment by the managers of these lands, will do little to solve the problem.

Too few of our Federal land managers are effectively representing the interests of the land, plants, and creatures who live upon it, not to mention those of us concerned with its future.

Roads that are to be used for vehicular travel should be designated by signs and maps, and most other areas should be closed. Ample areas should be designated for ORV recreation so that these users can be accommodated fairly and appropriately. No one, through ignorance or lack of concern, should be allowed to continue to destroy the land that belongs to all of us.

Solutions regarding misuse of ORVs are not complex nor expensive. Education is the key. The public and private sectors must recognize that ORVs' destructive effect on our public lands is significant and accelerating. Research is needed to measure current damage levels and plan control measures for the overwhelming numbers of ORV's sure to come. Where appropriate, our Cooperative Extension Service should take the lead in providing the user and the general public with information pertaining to the public lands—ORV issue.

Soil, Plant Water Conference

An International Conference on Measurement of Soil and Plant Water Status will be held at Logan, Utah, on July 6-10, 1987. Topics to be covered include: soil water content; soil water potential; plant water content; plant water potential and its components; and integration of soil and plant water measurements into water management systems.

This conference is sponsored by Utah State University as part of its Centennial Celebration. For more information contact: R.J. Hanks, Department of Soil Science and Biometerology, Utah State University, Logan 84322-4840 -phone (801) 750-2175.

Time-controlled Grazing

Time-controlled grazing on the Kiowa and Rita Blanca national grasslands will be examined at a seminar and tour June 19 at Draper Community Center, 7 1/2 miles east of Texline, Texas. Topics include cells in Texas, Oklahoma, and New Mexico; electric fencing; and principles of holistic resource management. Reservations required prior to June 10. Contact Kiowa National Grassland, 16 No. Second St., Clayton, NM 88415; (505) 374-9652.

First 100 Years of the Alexander Ranch

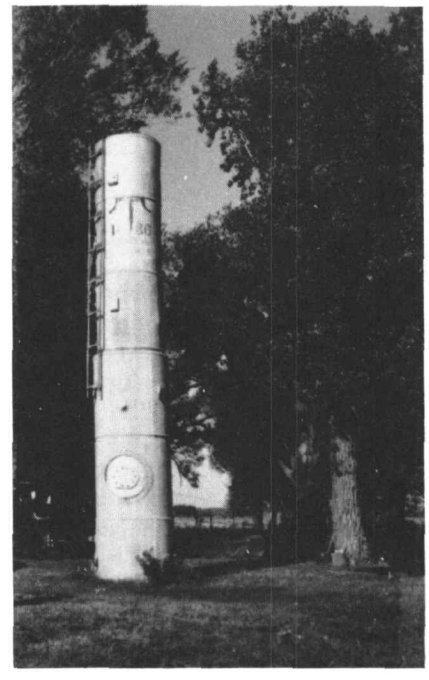
D. Morris Blaylock

"Wagons Roll" was the order of the day for the Alexander family early one spring morning in 1886. The family was moving north from Mobette, Texas, to the south bank of the Washita River in the Texas Panhandle, Hemphill County, a long day's journey by wagon. The Alexanders camped near a Washita River crossing and began preparing to develop a home site. The initial living quarters were a dugout, where they lived until a-two room frame home was constructed. The lumber for the home was hauled by wagon from Harrold, Texas, 200 miles away.

The old Alexander ranch house.

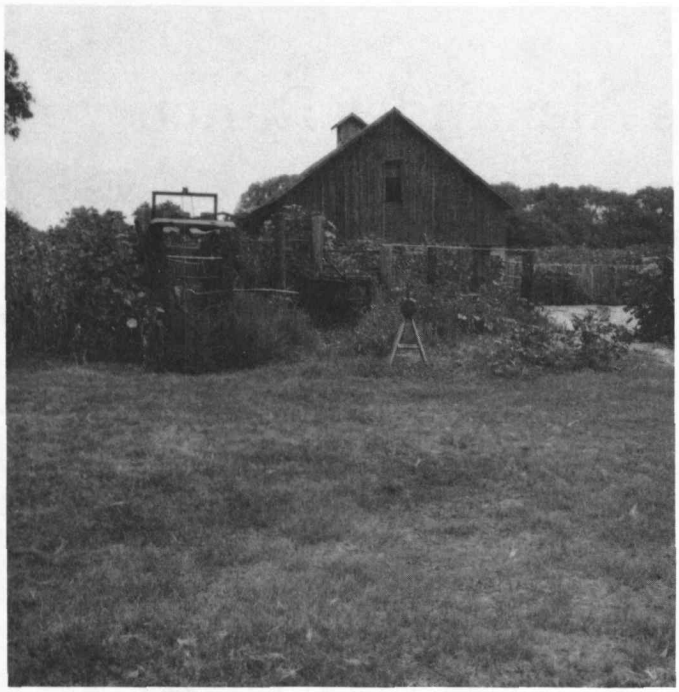
Hard work was the game plan to obtain the basics for survival—food, shelter and clothing. R.T. Alexander, the second oldest son, was only 13 years old. In 1887, R.T.'s older brother left home to become a minister, leaving R.T. as head of the house and in charge of the ranch. He worked hard to obtain food, shelter, and clothing. He drove wagon teams used in tearing out an ill-fated east-west drift fence that was constructed to keep range cattle from drifting back south in the winter. He sold hay to the Army Post at Mobeetie and to the Santa Fe Railroad Co. that was laying a rail line to Canadian, Texas. He also gathered and sold buffalo bones for $8 per ton at Canadian. R.T. attended school in Los Angeles, California, from 1889 to 1891. In 1891, he started teaching at the Cataline School located on the ranch. The salary was $40 per month for a school term of five months.

Cattle for the ranch were first purchased in 1887. A car load of spotted cattle were shipped via railroad from Midlothian to Clarendon, Texas, then trailed 100 miles to the Alexander ranch. In 1902, R.T. got into the Hereford cattle business with the purchase of 10 unregistered cows for $15 per head. The next year he purchased three Gudgel and Simpson registered bulls and another registered bull at Amarillo, Texas. In 1909, the Alexander Ranch purchased 54 head of registered Herefords. This was the beginning of the excellent Hereford cattle produced on the ranch today. This line has furnished foundation cattle for different ranches.



Water tower near the old Alexander ranch house.

In 1909, R.T. attended the Kansas City Royal Livestock Feeder Show. His comment about the feeder steers was, "I have calves by my Gudgel and Simpson bulls that are this good." The next year R.T. took a 20 head load of his feeder steers to the Royal Show and placed third. Since that time, the ranch has exhibited excellent Herefords at top livestock shows. The most recent was at the 1986 Fort Worth, Texas Livestock Show in January, where the Alexander Ranch entered two pens of heifers in the Texas Hereford Association



Barn constructed in 1914.

Three upstream flood control dams were constructed about 1960.

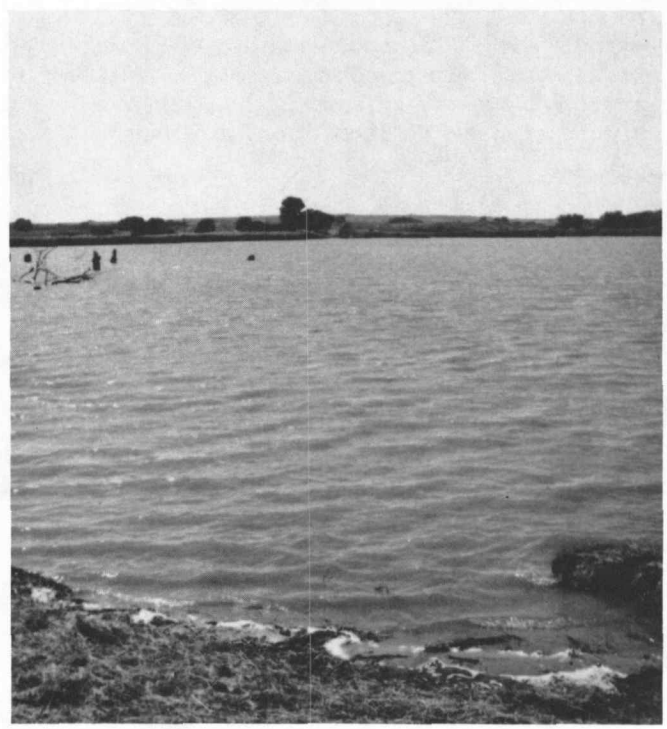
and sale. One pen brought top dollar in the carload sales.

While R.T. was improving his cattle and ranching business, he was also expanding the ranch land holdings. The original land was obtained by a patent for a section (640 acres) from the state of Texas less 3 acres taken out for a cemetery. Additional adjoining land was purchased when available and finally encompassed 8 1/2 sections along the Washita River. Soils along the river are sandy changing to loamy and clayey on the uplands.

The ranch is located in the eastern edge of the short-grass lands but has short, medium, and tall grasses. The average rainfall is about 24 inches but there are wide fluctuations in yearly amounts. Near the humid border, several years of above-average rainfall may encourage tall grasses and convert the short-grass land to tall grassland. Overall, about 18 1/2 acres of the grassland will support one animal unit (AU).

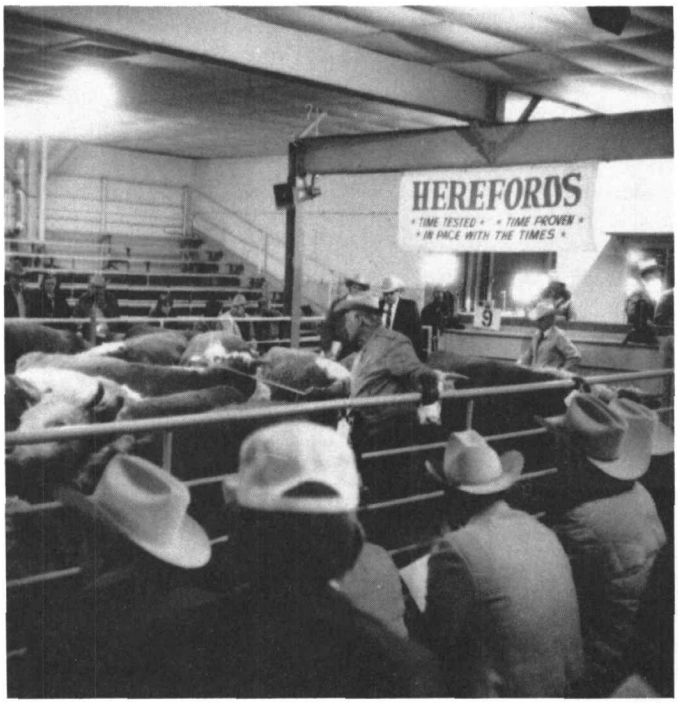
Before Texas became a state, the plains buffalo along with the pronghorn antelope and white-tail deer were the main grazing animals in the Texas Panhandle area. The main game birds on the ranch in the early days were the lesser-prairie chicken, bob-white quail and the Rio Grande turkey. Early day pedators were the cougar, coyote, and grey wolf. Because of people pressure, almost all game and predator species have decreased except the coyote. A new wildlife species has invaded the ranch, the armadillo. The coyote and the armadillo will probably be around for a long time.

In 1946, R.T.'s son, R.T. "Ted" Alexander became the managing partner of the Alexander Ranch. He has continued to improve the ranch and the business of ranching. Three upstream flood control structures and a lake have been constructed on the ranch. Ted wanted to share a part of the ranch way of life with friends and neighbors at a fair price and ventured into the ranch recreation and hunting business. The lake was stocked with fish. Recreation and hunting on the ranch were not compatible with the cattle business and so the gate was closed on the ranch recreation and hunting venture. In addition to improving the Alexander Ranch and their Hereford business, Ted also contributed work and knowledge as an active member in the Texas Hereford Association.

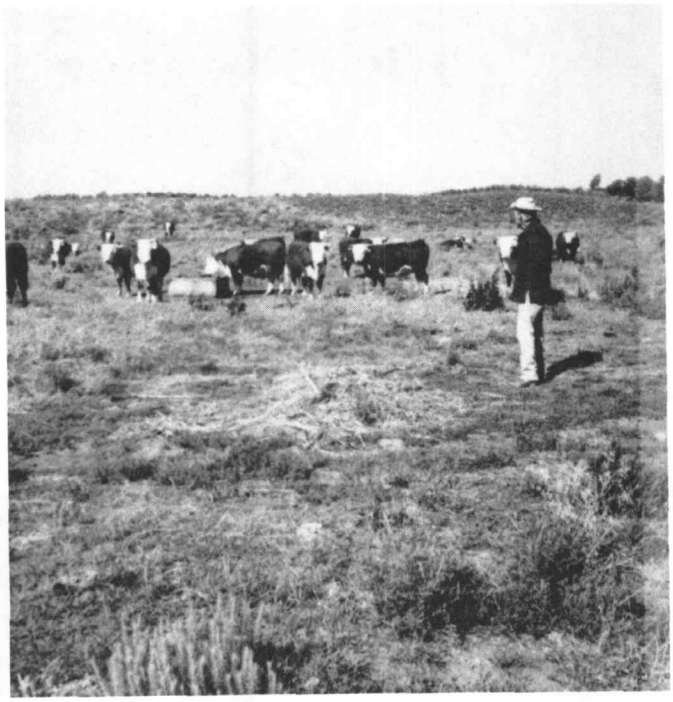


Lake Alexander.

In 1956, R.T. Alexander was made an Honorary Member of



Ted Alexander showing a pen of registered Hereford heifers at the Fort Worth, Texas, Livestock Show.



Ted Alexander checking his Hereford heifers.

the Texas Hereford Association and in January 1986, Ted Alexander was also designated as Honorary Member. It takes a special kind of person such as Mr. R.T. Alexander to succeed in pioneering in ranching and establish a herd of pure bred registered Herefords. It also takes a special kind of person like R.T. "Ted" Alexander to follow in his father's footsteps and improve the ranch and Hereford beef business. It will take similar innovative progressive management, hard work and foresight for the Alexander Ranch to succeed another 100 years. ●

High Elevation Grasslands of Nepal

Daniel J. Miller

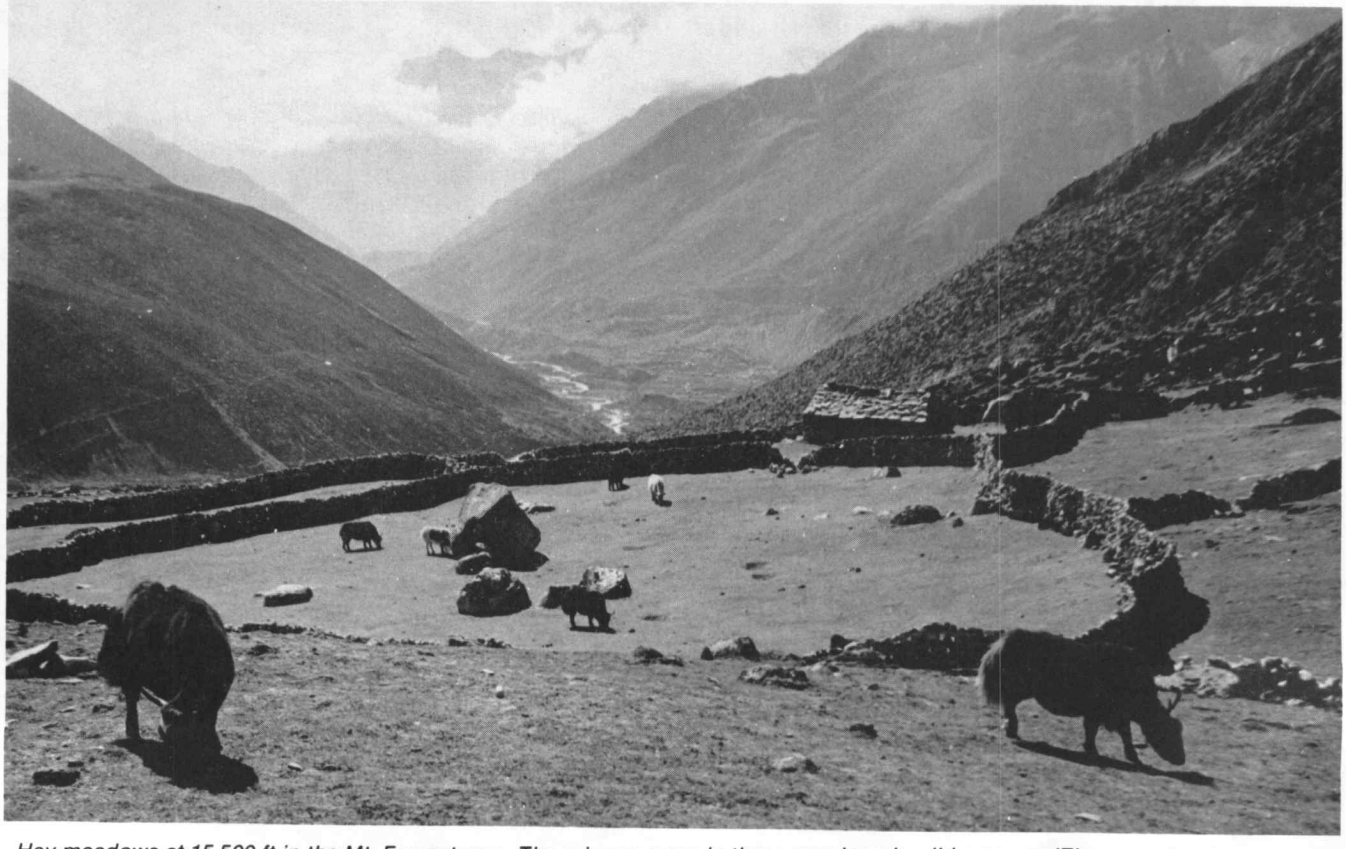
It was sunrise in the Himalaya and it was a sight I would never forget. I was standing at 16,000 feet surrounded by 23,000 foot snow peaks glowing with the rays of the morning sun. Stretched out in front of me was a lush green carpet of alpine grasslands dotted with colorful wildflowers. In the distance herds of yaks grazed peacefully and the stillness was broken by the shouts of herders and the cracks of their yak hair sling shots as they moved their animals across some of the highest rangelands in the world.

As a Peace Corps Volunteer in Nepal in the mid 1970's I worked with a Government of Nepal pasture development project and in early 1984 went back to Nepal to conduct range inventories for a US-Agency International Development project involved with resource conservation. The objective of this paper is to acquaint readers with some of the rangelands found in Nepal.

Nepal is a small Asian country running northwest to southeast between latitude 26 and 30° N. Sandwiched in between India to the south and Tibet to the north Nepal is about 500 miles long and 90 to 110 miles wide. The Himalaya mountain range extends all across northern Nepal. Nepal is a land of incredible contrast. In the south, along the Indian border, there are subtropical forests and savannah grasslands where rhinoceros and tigers are found. Only 90 miles away from these steaming jungles are located the highest mountains in the world.

Climatic conditions in Nepal are varied depending on altitude. Most of the precipitation is concentrated during the monsoon season, lasting from June to September. Generally, the rains are greater in July and August. Some subtropical valleys on the southern slopes of the Himalaya receive up to 200 inches of precipitation while in the rain shadow on the north side of the Himalaya it is very arid with less than 15 inches of rainfall. Snowfall makes up a small percentage of the total precipitation.

Grasslands vary from subtropical to alpine and cold-dry steppe and cover about 4.2 million acres of land or about 12% of the total land area of Nepal. Grasslands dominated by subtropical grass species are found up to about 6,000 feet. Common genera were *Chrysopogon, Cymbopogon, Themeda, Eragrostis, Apluda, Cynodon, Bothriocola, Saccharum, Heteropogon*, and *Arundinella.* Most of the existing subtropical grasslands are found only on land too marginal for crops and have been severely overgrazed. The rapidly growing human and animal populations in the mid hills of Nepal are having a profound deteriorating effect on the existing grasslands and forests.



Hay meadows at 15,500 ft in the Mt. Everest area. The primary grass in these meadows is wild ryegrass (Elymus nutans).

Herdsmen and horses in Dolpo. Caragana bushes in foreground.

The Langtang Valley of north central Nepal is a higher inner valley located at an elevation of 11–13,000 feet. H.W. Tilman, the first Westerner to visit the area in 1949, termed the valley "a grazier's paradise." The broad valley and mountain slopes provide grazing for large herds of domestic yaks and sheep in addition to wildlife like Himalayan tahr and musk deer. Southern exposure slopes at 10–11,000 feet are dominated by *Andropogon tristis* and *Arundinella hookerii.* In grasslands at higher elevations up to 15,000 feet the dominant genera were *Danthonia, Festuca, Elymus,* and *Stipa.* Other commonly encountered genera were *Agrostis, Deyeuxia, Poa, Helictotrichon, Bromus,* and *Tristeum.* Shrubs such as *Juniperus, Rhododendron, Berberis, Lonicera* and *Caragana* are also frequently found. Above 15,000 feet rangelands were dominated by *Festuca ovina* and genera *Carex* and *Kobresia.* Forbs are also very important members of the alpine plant community.

Yak herders' hut in the Langtang Valley.

A herder's hut of canvas at over 14,000 ft.

The subalpine and alpine rangelands in the Langtang Valley are grazed in the summer by large herds of yaks, yak hybrids, and sheep. These animals are taken to these high elevation grasslands in June, where they stay until October when they are taken to lower elevations. While in the high pastures herders live in permanent stone walled structures. Female yaks and yak hybrids are milked and milk is made into butter and cheese. In the winter animals are either kept around the villages or taken to the grazing lands at even lower elevations.

In Langtang, as in other parts of Nepal, hay making is practiced. Native grass is cut in September when the monsoon ends and hay is fed to livestock during the winter. In the Khumbu region near Mount Everest, Sherpas, who are famous for their exploits on climbing expeditions, also have large herds of yaks that graze alpine rangelands. Sherpa herdsmen maintain extensive hay meadows at 14–15,000 feet where the dominant native grass used for hay is a wild ryegrass, *Elymus nutans.* In the Kali Gandaki Valley at eleva-

Tibetan goats being milked in Dolpo, 15,000 ft.

Yearling yaks.

tions of 8,500 feet native grass is also cut for hay by the villagers. In this region the most common native grass species used for hay is *Pennisetum flaccidium*. A native alfalfa is also widely grown for hay making in the arid environment of the Kali Gandaki.

Mature yak.

Many of the high elevation grasslands in Nepal are heavily overgrazed. In the drier Tibetan-like steppe areas of Dolpo and Mustang to the north of the main Himalayan range overgrazed rangelands are a serious problem. In these regions herders, although not actually nomads because they have homes and fields, live much like Tibetan nomads in yak hair tents the year round as they take care of their sheep, goats, and yaks. Nomads in Tibet were called drokpas, which means "people of the high pastures." These nomadic-like herders living near the Tibetan border in Nepal have traditionally had access to grazing lands in Tibet where they took their herds during the winter to graze. These grasslands in Tibet that have been used for centuries by Nepalese pastoralists are now being closed to them by Chinese authorities.

These restrictions may have serious effects on the rangelands and pastoral economy of northern Nepal. Many of these border areas in Nepal received extremely heavy grazing pressure in the early 1960's when Tibetan refugees fleeing from the Chinese brought large herds of yaks and sheep into northern Nepal. Thousands of animals died because of a lack of forage. The closing of the Tibetan border to livestock from Nepal now may cause even further deterioration in the condition of the high altitude rangelands in northern Nepal unless urgent steps are taken to initiate rangeland rehabilitation programs and provide adequate winter feed supplies●

Color Photos

Although it is not feasible financially for us to offer illustrations in color in the body of the journal, we have investigated the possibility of handling groups of color articles in one segment of the journal. Such a project would involve additional expense for page charges and possibly some delay in publication, but might bring costs within the capability of authors to whom color photographs are essential. Authors who may be considering this should contact the editor: 2760 West Fifth Avenue, Denver, Colo. 80204; (303) 571-0174.

Yaks

Daniel J. Miller

Yaks are found from Afghanistan to Western China, from the subtropical southern slopes of the Himalaya in Nepal and Bhutan to the taiga forests of Mongolia. Man could not live on the "Roof of the World" without yaks. Numerous Central Asian tribes like the Kirghiz, Kazaks, Mongols. Tibetans and Sherpas depend on the herding of yaks for survival in some of the most inhospitable and scenic environments in the world.

Female yak hybrid crosses called chauri *in Nepali being milked in the Langtang Valley.*

The long hair that the yak is famous for is used for making ropes, blankets, pack bags, and even tents. Yaks also provide a fine inner wool that is spun and woven into clothing. In parts of Nepal and Tibet, yaks herders still live year round in yak tents. Tough, proud herdsmen, who still wear their hair long in braids in the old style, can be seen spinning yak wool with drop spindles as they take care of their great shaggy beasts. Young boys, running barefoot across alpine meadows while herding yaks, use yak hair sling shots that sound like rifle shots. Women with sunburned faces the color of good bourbon and wearing the family's wealth in beads of coral, amber, and turquoise sit for hours at back strap looms weaving yak hair blankets.

Female yaks are important milk producing animals. Yak milk, which is extremely high in butterfat content, is used for making butter and cheese. In many regions of Nepal yak butter is made by churning milk in large wood barrels. A pole with paddles on one end is placed in the barrel of milk and spun by two herders pulling on leather straps. They sing a "Butter Making Song" while churning to maintain a steady rhythm. In Dolpo, the region of Nepal to the north of Dhaulagiri Himal, nomadic herders make butter by using an old yak hide sewn together like a barrel. It is filled with milk and rocked back and forth until butter forms.

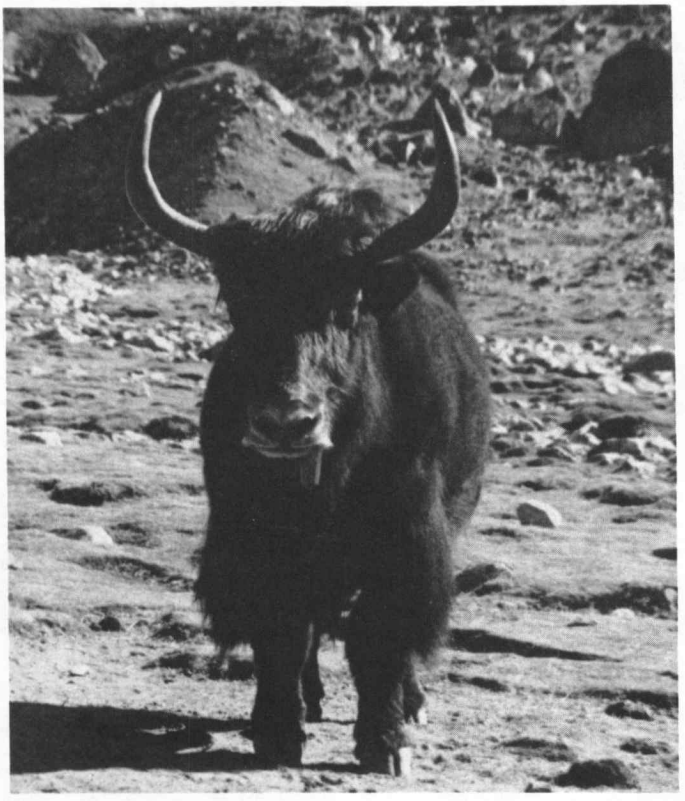
Wooden barrel used to churn milk into butter.

Large quantities of yak butter are used in making "Tibetan tea," a tea brewed with butter and salt. Butter is also used for burning butter lamps in Buddhist temples and large caravans of yaks carrying butter from pasture lands to monasteries were common sights in Tibet. In Nepal at elevations of 16,000 feet, cheese factories established with Swiss technical aid produce cheese from yak milk that is sold in Kathmandu to tourists. A traditional kind of cheese is made by herders from buttermilk and dried in the sun, which enables them to keep it for months without spoiling. Both butter and cheese are traded or sold for grain and other goods that herders require.

Yaks are also beasts of burden and are used for plowing fields and carrying loads. In many parts of the Himalaya enormous quantities of grain from the mid-hills are taken to Tibet on the backs of yaks in large caravans and traded for salt and wool. Yaks are surer footed than horses and easily negotiate 17,000 foot passes with 150 pound loads. Climbing expeditions in the Himalaya would never even make it to their base camps if yaks weren't available to transport their gear.

Yak hides are used for making boot soles, ropes, and in many parts of Tibet yak hide coracles are still used to cross large rivers much as Indian tribes on the Upper Missouri River used buffalo bull boats. White yak tails used to be an important export item from Tibet. They were used to make Santa Claus beards. Yak tails are still important in rituals among the Newar people of Kathmandu, Nepal. Yaks are even on the five rupee note of Nepal.

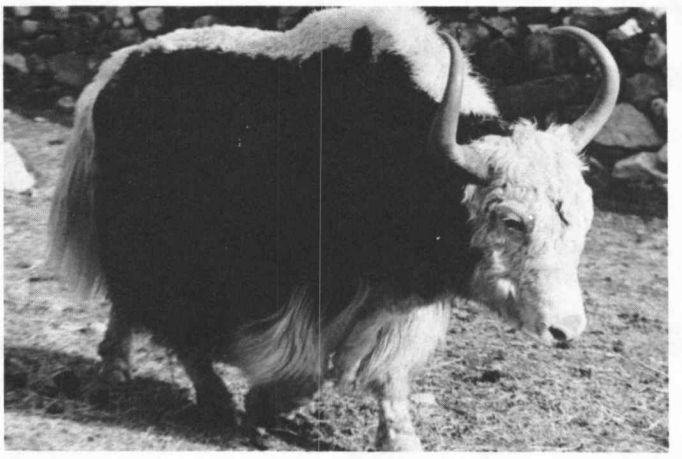
Not only are yaks used as the sustenance of life, but they are also linked closely to the cultural and ritual activities of



Yak used for packing supplies to Mt. Everest base camp at elevations of 18,000 ft.

Yak hybrid crosses being used as draft animals.

herding societies. In the Langtang Valley of Central Nepal when the yak herds are brought to the summer pastures in early June, there is an important festival. Yaks are outfitted with bells and colorful tassels. Even the horns of yaks are shined with butter. Each family's belonging are packed in bamboo baskets and people and yaks join in a colorful procession to the summer grazing lands. Homemade alcholic beverages are consumed in large quantities and people sing and dance until late in the night for a couple of days. Offerings are made to the monks in the nearby temple and juniper branches are burned as incense to the mountain gods. For months now the people tending the herds will be away from the villages and their families.



Mature yak bull.

Elaborate ceremonies are also held during the summer to dedicate certain yaks to the local mountain gods in ritual sacrifices so that the mountain deities will look favorably upon the villagers and insure plentiful harvests.

During one of the Nepal-Tibet wars in the late 18th century when the Gurkhas, as the Nepalese troops are known, had invaded Tibet and were starving for lack of food, the Hindu priests with the Gurkhas pronounced the yak to be species of overgrown deer. This allowed the hungry Nepalese soldiers to kill and eat yaks since they were no longer considered sacred as cows were according to their Hindu religious beliefs.

Yak herders still relate legends on the origin of yaks and believe that yaks originated from one of three sister cows that lived in the mid hills of the southern Himalaya. Because the cows were hungry for salt one of the sister cows volunteered to go to Tibet in search of it. Knowing it would be cold in Tibet one of the sisters gave up her coat of hair to the one going north in seach of salt. The cow that went to Tibet in search of salt found lots of salt and decided to stay there and became the yak. The cow that gave up her coat of hair went further south where it was warmer and became the water buffalo.

The yaks, *Bos grunniens,* is taxonomically closely related to the tropical members of the genus *Bibos,* the banteng and gaur. Domestic yaks are descendants of wild yaks captured and domesticated thousands of years ago in eastern Tibet. Wild yaks are still found in Tibet and they are huge. Wild yaks have been reported reaching a height of six feet at the shoulders and weighing 1,800 pounds! Domestic yaks are much smaller with the males reaching heights of five feet at the shoulders and weighing up to 1,000 pounds. Female yaks are smaller and have a gestation period of 258 days. Female yaks give about one liter of milk a day.

During the Pleistocene era yaks were found in Alaska along with mastodons and saber toothed cats. Even now in Alaska and Montana yaks can be found at rodeos where they have a reputation of bucking good cowboys off before the buzzer.

There is a real need for more research on yaks, Central Asian grazing systems and yak grazing behavior so that the productivity of yaks and yak hybrids can be increased. ●

Round Table for the Promotion of Range Management in South America

B.J. Ragsdale

"The first time ever for South America" was the phrase to describe a week-long Round Table held in Santiago, Chile, on December 2-6, 1985. The Round Table was co-sponsored by the FAO Regional Office for Latin America and the Caribbean and the Departmento de Zootecnea, Facultad de Agronomia, Pontifica Universidad Catolica de Chile. Dr. Don Huss, FAO Regional Animal Production Officer and Drs. Juan Gasto and Osvaldo Paladines of the Universidad Catolica organized and conducted the Round Table. Countries represented included Chile, Brazil, Argentina, Peru, Uraguay, Bolivia, Columbia, Ecuador, and Venezuela. The Society for Range Management was represented by Dr. B.J. Ragsdale, Past President.

A major goal of the Round Table was to form a working group to promote and develop the management of rangelands and stimulate the development of the range resources of South America. The long-range objectives would be to increase animal production, prevent additional desertification and conserve natural resources—soil, water, wildlife, and plants.

Presentations given by representatives from each of the participating countries provided a framework for working groups to develop a plan to meet the Round Table's objectives. Topics included the conceptual basis for the management and utilization of rangelands, the rangeland situation of each of the participating countries, and the present state of range knowledge and research in South America. Other topics concerned tame pasture research in Chile, development of range management in the United States, and range Extension activities in Texas.

Four study groups were formed to delve into education, formalization of the work group, research and promotion, and studies of the present situation.

Common rangeland resource problems of the South American countries recognized by the Round Table are:

1. There is a lack of uniformity in the criteria and language used in the descriptions, characterization, and cartography of the rangelands.
2. The social and economic situation of the range ecosystems has had little study. Generally only vegetation has been considered, not ecosystems in which man is the main manipulator.
3. Although scientific knowledge is available, it is seldom applied.
4. The governments of these countries generally do not consider the promotion of range management.
5. The activities tending to promote range management are scarce at a country level and international programs are not coordinated.
6. There is a shortage of personnel specialized in range management.
7. The national governments and international organizations pay very little attention to the study and diffusion of knowledge related to range management.
8. The people are not conscious of the importance of the rational use of their rangelands.
9. At a regional level there is a lack of a precise language to define the concepts in range management.
10. There is a lack of methodologies to collect and evaluate information, and when it is done, there is a lack of continuity in the process.
11. The concept of multiple use of the range ecosystem is unknown in most cases.

The Round Table suggested the formation of an "International Working Group for the Promotion of Latin America's Rangelands" that would have as its objective the maintenance of permanent communication and coordination among the national and international organizations involved in range management and the promotion of the following activities:

1. Initiate an analysis including the state of the art, the advances in research, the socio-economic situation, and the most relevant problems, each according to its priority.
2. Create and organize a bibliography with specific publications on rangelands.
3. Promote the formation, at a country level, of interinstitutional and interdisciplinary groups that can cope with the problems and develop specific methodologies.
4. Support research programs to solve the problems.
5. Promote and support initiatives towards the formation of a trained manpower pool to assure the continuation of a permanent education program.
6. Promote the formation and organization of a structure for extension and transfer of technology that will be related to research.
7. Promote any activity that has as a goal the improvement of the present situation in the area.

The Round Table also suggested that:

1. The FAO Regional Office create an Executive Secretariat in charge of the Regional Animal Production Office to be incorporated as part of its priority work programs having the following objectives:
    a. Coordinate the activities of the International Work Group.
    b. Search for the financial resources required for the operation of the Secretariat and for the development of the projects that arise as part of the activities proposed by the group.

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Note: Bob Ragsdale is one of the Past Presidents of the Society. He represented the Society for Range Management at this meeting in Santiago, Chile.

2. The "International Working Group" would be formed, *Ad-Interim,* by the persons participating in the Round Table. The members would remain as such until ratified by their governments.
3. The FAO Regional Office publish a proceedings of the papers presented at the Round Table.
4. The FAO Regional Office support the conducting of national and/or international courses to train leaders in range management.
5. Argentina's Instituto Nacional de Tecnalogia Agropecuria (INTA) publish the Range Management Training Manual prepared for a course on the subject that was conducted in Argentina in 1982.
6. The University of Chile, through its Centro de Estudias de Zonas Aridas of the Facultad de Ciencias Agraras y Forestales organize, publish and distribute a newsletter on the activities related to the rangelands of Latin America and the Working Group.

A midweek break in the Round Table agenda was a field trip to the livestock farms of Ricardo Aristia de Castro and Juan Edwardo Castillo to observe livestock production and Mediterranean rangeland. Both range and tame pastures were utilized for range in the programs. Mr. Aristia de Castro had purebred Herefords, but was beginning to use Charolais bulls in a cross breeding program. Mr. Castillo had a fine wool sheep operation (13,000 high quality breeding ewes) but also grazed cattle (Clavel and Freisian).

Diversification of enterprises was noted on both ranches. With the Pacific Ocean serving as a boundary on Mr. Castillo's Station Lucia Farm, sea water was being evaporated to produce salt. Alfalfa, wheat and chick peas were also being produced on the farm. Mr. Aristia de Castro had swine, corn, and a charcoal operation which utilized a species of *Acacia* that was being cleared from certain range sites.

The field trip afforded the opportunity to observe the agronomical and horticultural production in the Santiago area. A wide range of vegetable and fruit crops was being produced; a major portion of some of the crops is exported to the United States. ●

Good Range-Good Forages: Are They Equal?

R.D. Pettit

Every range manager, agronomist, rancher, or technician has a favorite forage which they "swear" will alleviate many agricultural-forage problems. Because of many different opinions, I wonder if there is a "perfect" forage. Do we really have any common standards to judge the quality of plants or plant communities? A favorite story about forages was one by my barber in Corvallis, Oregon. He always mentioned that black-tailed deer liked his garden! For two years he swore that deer only ate tomato plants! In Texas I hear the same story but with a more drought tolerant plant! A lot of folks do not agree on the components of a good forage.

Frequently we note that some grasses, forbs, shrubs, or trees are relished by grazing animals. When asked why, no one can give a definite answer. We cannot ask the animal why it ate a weed one day and our favorite forage the next. Once I noted a heifer feeding exclusively on pine tree seedlings. Two weeks later, ninebark was the preferred forage. Also, cattle relish weedy primrose and ragweed! Quite frankly, we cannot give a good answer as to why animals graze *what* and *when* they do. We can only conclude they like *variety* in their diet.

There is increasing interest in "weed ranching." Some feel that weeds, whether grasses or broadleaves, are the way to make money in the ranching business. Others believe in the "good" plant theory. Many are tempted to judge the management skills of their neighbors based upon the way his pastures or range look. Sometimes "Joe" makes more net profit than his neighbor who stocks moderately and/or rotates his grazing allotments and has good range. Who is the best or perhaps wisest manager?

Many rate alfalfa as near perfect. Can you think of any better species? We all know at least one or more weakness. For example, bloat, weevil damage, dodder, and other problems come to mind. Is this a manager's problem rather than a forage weakness? Occasionally, we get a big head in lambs from grazing kleingrass or emphysema in cattle from grazing Bermuda grass. Johnson grass also has received "bad press" because of prussic acid poisoning, particularly on regrowth after frost or drought. Many forages, in every state, occasionally receive bad publicity from ranchers. It is interesting that one rancher's nightmare might be another's "gold mine".

In a plenary session of the Soil Science and Agronomy meeting in 1976, an animal scientist was "jabbing" agronomists for not breeding forages with lower fiber and higher digestibility. One gentleman from the audience got up and with all the modulation he could muster, shouted, "Why do not animal scientists seek a breed of cattle with smaller bones"? You can imagine the audience's response! A good point, nevertheless, animal scientists and agronomists have not often worked collectively to provide efficient production of a salable product.

We have come a long way in a few years to develop inter-

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In the native state sand shinnery oak makes up 80 to 90% of the production. An occasional grass plant can be seen but cattle have to spend considerable time grazing to get their daily dry matter requirements.

disciplinary programs to minimize criticisms between and strengthen the disciplines. Coordinated efforts among agronomy, range and wildlife science, animal science, agricultural economics, and engineering are being used at Texas Tech and elsewhere to integrate available knowledge into economically feasible plans. We try to tailor this to individual ranch needs.

This article points out some evaluation characteristics of forages using a modified European approach (Molen and Koelstra 1956). If an area consists of several communities, each is rated separately than adjusted or weighted to get an average pasture quality worth. Although subjective, as most ratings are, it might provide a new perspective about what we see on the land. The score sheet after the pasture was evaluated ranges between 0 to 10 with 0 to 3 being bad; 3.1 to 5 rates insufficient; 5.1 to 6 as medium; 6.1 to 7 was sufficient; 7.1 to 8 rated good; and 8.1 to 10 was considered excellent.

Evaluation Characteristics of Forages

Most plants have both desirable and objectionable traits. Consequently, it is difficult to assess a plant's forage value. Just when we feel we know the best forage, the animal no longer selects "our" preferred forage or forages. Has the preference changed, or are we dealing with a forage palatability factor not understood?

The criteria I use for evaluation are modified from Molen and Koeltra (1956). Guidelines for this evaluation are from observing cattle on a grazing study for 2 years on a tebuthiuron-treated and untreated sand shinnery oak range. Second, studies on the eco-physiology of this community for 15 years looking at roots, growth, carbohydrate storage, etc., have been used.

1. *Longevity of species.* Is the forage an annual or perennial? If a perennial, does it live for only a few years or is it going to be around for many years? Annuals will receive a low rating here but if they are palatable and grow every year, other criteria ratings can be high.
2. *Palatability factors.* Do animals readily accept the forage through the grazing period or do they try to find other plants before they graze it? Is the plant tender (succulent) or coarse? Does the plant have spines or other features affecting its palatability?
3. *Regenerative ability.* The forage produces many viable seeds, has stolons and/or rhizomes, and can regenerate quickly; or the species spreads slowly and has a low seed crop and/or germinability.
4. *Quality components.* This is primarily related to digestible protein, phosphorus, cellulose, and other nutritional parameters.
5. *Yield.* Often genetics control the potential dry matter yield of a species. Superimposed on this are the environmental factors; precipitation, air and soil temperature, and soil nutrients. Growth, with little precipitation, is especially important on arid-semiarid ranges.
6. *Seedling vigor and establishment ease.* Many seedings fail because too much time is required from seeding date to first root emergence. Such seedlings may be especially vulnerable to environmental stresses. Also insects and small mammals may clip off the first leaves. For example, 2 or 3 days may be sufficient to germinate weeping lovegrass, while buffalograss is slow to germi-

Table 1. Ratings of more important forages on sandhill rangeland in west Texas using 10 forage quality factors.

Quality factors	Little bluestem	Purple threeawn	Sand dropseed	Thin paspalum	Red lovegrass	Hairy grama	Other grasses	Perennial forbs	Annual forbs	Shin oak	Other shrubs
Longevity	10[1]	7	8	5	5	9	5	7	0	10	7
Palatability	7	4	9	9	2	10	4	10	3	2	3
Regeneration	7	4	8	7	8	8	4	7	9	9	1
Quality	7	4	7	8	2	10	5	10	4	1	3
Yield	10	6	6	3	2	3	2	2	4	10	1
Vigor	5	6	8	7	7	6	2	4	9	1	1
Resistances	10	10	9	5	8	9	7	9	9	8	9
Grazing tolerance	8	8	8	9	10	10	7	8	3	9	8
Root structure	9	4	6	5	3	7	4	6	2	10	2
Management	7	3	7	6	4	9	3	9	6	Ç8[2]	1
Average[3]	8	5.6	7.6	6.4	5.1	6.2	4.3	7.4	4.9	5.4	3.6

[1]Quality rating on a 1 to 10 scale with 10 representing the highest rating and 1 the lowest.
[2]Rated as such because of toxic property.
[3]These averages are multiplied × composition to derive species values.

Much of this range can be converted to a midgrass prairie after treatment with tebuthiuron. This typical view was taken three years after herbicide application. Dominant grasses here are little bluestem and the light-colored purple threeawn. Average height of the bluestem is over three feet. No range seeding has been used.

nate. Seeding depth, rate of first root elongation, seed coat characteristics, available endosperm tissue, amount and frequency of precipitation, and other factors affect vigor and establishment. Millions of dehisced seeds in the oak type germinate but rarely do any survive when the sandy surface becomes dry and hot—over 150° F.

7. *Resistances.* Many forages are more resistant to parasites, drought, freezing, insects, etc., than are others. The biochemical makeup (gallotannins, terpenes, etc.) of the plant is important to species tolerance of these external influences. Removal of all branches from sand sagebrush and placement below the canopy leaves bare areas; allelopathic, I believe.
8. *Tolerance to grazing or defoliation.* Timing and elevation of growing points and the amount of leaf or stem tissue that may be harvested without injuring the plant are important characteristics. Effect of grazing on root growth and tiller formation need to be considered in an appraisal program.
9. *Rooting structures.* Deeply rooted plants or those with large taproots and/or rhizomes are more desirable in many areas than are weakly fibrous roots that penetrate only into the topsoil. Plants with a high root to shoot ratio have several advantages over those with a low ratio. Large underground rooting structures not only store water during wet periods, but vast amounts of energy are stored as "insurance" against drought and defoliation.
10. *Management problems.* This may be the most important criterion for evaluating a forage. It takes into consideration many of the above criteria and it considers the expertise of the manager. Time of grazing, toxic properties, bloating, and spines-thorns are among the many factors to be considered here.

An experienced manager can rate each species in the pasture or range based upon these criteria and determine its relative worth. Using a scale of 1 to 10 for each criterion, a perfect forage in a pure stand would receive 100 points (10 × 10) in this system.

An example of forage parameters and the rating system follows. The setting is an untreated and tebuthiuron treated sand shinnery oak type which predominates on sandy soils in west Texas, southeastern New Mexico, and western Oklahoma.

This is a deciduous mini-forest in a semiarid environment. Most "trees" only grow 1 to 2 ft. tall. Its extensive rhizome system gives a root-shoot rato of up to 16:1 and has up to 10,000 stems per acre. Current year yields show the oak to be about 80% of the herbage.

When oak is killed by herbicides, this type is converted to a midgrass prairie with little bluestem dominant. A secondary decreaser is sand bluestem while major increasers are sand dropseed, thin paspalum, red lovegrass and purple threeawn. From 20 to 30 other grasses, forbs, and shrubs make up the remaining components of this community.

Table 1 gives species ratings using the 10 evaluation characteristics. The community evaluation (range value) is in

Table 2. Yield, composition, and average value of forages on sand shinnery oak range treated (Tr) and untreated (Untr) with tebuthiuron. Data taken August 1979, Cochran, County, Texas.

Species	Yield		Composition (A)[1]		Rating (B)[2]	(A) × (B)[3]	
	Untr.	Tr.	Untr.	Tr.		Untr.	Tr.
Little bluestem	60	500	4.8	29.6	8.0	38.4	236.8
Purple threeawan	61	150	4.8	8.9	5.6	26.9	49.8
Sand dropseed	28	270	2.2	16.0	7.6	16.7	121.6
Thin paspalum	10	70	0.8	4.1	6.4	5.1	26.2
Red lovegrass	24	180	1.9	10.7	5.1	9.7	54.6
Hairy grama	33	100	2.6	5.9	6.2	16.1	36.6
Other grasses	50	120	4.0	7.1	4.3	17.2	30.5
Perennial forbs	50	105	4.0	6.2	7.4	29.6	45.9
Annual forbs	10	180	0.8	10.7	4.9	3.9	52.4
Shinnery oak	906	15	72.0	0.9	5.4	388.8	5.6
Other shrubs	25	0	2.0	0.0	3.6	7.2	0.0
Totals	1257	1690	99.9	100.1	64.5	559.6	660.0

[1]Composition is based upon dry weight (current years growth) of plants.
[2]Ratings came from averages in Table 1.
[3]Total divided by 100 gives average range value.

Table 2. Because oak contains considerable tannin-like compounds, it often kills animals, thus receives a negative rating for management. We know that forage quality is slightly improved after herbicide treatment but for this analysis the forage rating scale has remained the same. One conclusion from this appraisal is that treated sand shinnery oak range is more valuable after oak is controlled than without control. After dividing the weighted ratings by 100, untreated oak pasturage rates 5.6 whereas the treated range scores 6.6. When the contribution of oak is removed, untreated range scores 1.7 points, consequently the quality factor has increased following oak removal and is 3.9 times better if oak is not considered a forage resource.

Consumption of too much oak causes cattle to become "shinnered". When in this condition, the animal will seldom recover. Occasionally 25 or more percent of the animals are poisoned.

Because grass yields increase from 250 lb/acre in untreated to over 1,300 on treated areas, our assumption is that the range is more than two times as desirable after oak is killed. Our study suggests that we can more than double the stocking rates after oak is killed. Then we have other problems: the threeawn and little bluestem become unpalatable, forage quality diminishes in the fall, and cow condition starts to decline. So we have corrected one problem, the brush; *now* we have a grazing management problem.

In this evaluation I used composition percentages determined from herbage yields; however, other composition data would be just as applicable. This system rates little bluestem, hairy grama, and perennial forbs as quality components of the forage resource. The shrubs, sand sagebrush and Southwest rabbitbrush, are equally unpalatable as is the oak but not toxic; consequently a rating of 2 was given. For sheep and goats, these evaluations would change; however, few of these grazers are used in this specific oak type.

My Evaluation of the Method

I know this is a subjective approach to evaluate rangelands. It works for me because of the information gained from observation and research studies. Watch what your animals eat *throughout* the year and assign a preference rating; adjust it up or down as you desire; it makes no difference whether you rate high or low, as all plants will be on the same scaling system. Use a shovel to examine underground root structure and soil characteristics and take good notes of everything you observe. You must read the literature to gain as much information about your range type as possible. Ask others questions about what you observed.

Although not an unbiased technique, I find it helpful in our area. It can also be applied for ranch appraisal to compare prices for the "best buy." Currently, ranch appraisers have few guidelines to determine fair market value in this area. Use of this technique can also give a better approximation of stocking rate after oak is killed.

Details of how a rancher can use this evaluation technique are not possible without considerably lengthening this report. The 3 key factors in making it work are: (1) the same general range site needs to be compared. You cannot compare a wet meadow to grassy forest opening, (2) you need an experienced or educated guess of the rating each major forage should receive, and (3) a "ball park" or better estimate of forage composition must be available.

Readers desiring to do so are free to send me their estimates and I believe that I could make a fairly accurate evalua-

tion of the sites. Except in the short grass prairie where grama-buffalograss and dropseeds make up a high percent of the composition, a diverse mixture of good grasses (annual or perennial-cool and warm season), forbs (annual and perennial), and several palatable shrubs with persistent leaves is my choice. Many experienced cowmen in the Southwest claim to have better condition animals coming off range with a variety of these plants. Consequently, I do not believe that good range and good forages are equatable. Soil-site potential, livestock performance, and managerial skills are the master keys to successful ranch management.

'Lassen' Antelope Bitterbrush: a Browse Plant for Game and Livestock Ranges

Nancy Shaw and Stephen B. Monsen

A unique selection of antelope bitterbrush (*Purshia tridentata* [Pursh] DC) recently became the first accession of this valuable western shrub species to be released for commercial seed collection and production. Chosen for its productivity, palatability, winter leafiness, cover value, and seedling vigor, 'Lassen' antelope bitterbrush is a useful shrub for wildlife and livestock ranges, conservation plantings, and reclamation projects on adapted sites in the Intermountain and Pacific Northwest regions.

'Lassen' antelope bitterbrush growing near Johnstonville, Lassen County, California.

The release of 'Lassen' resulted from cooperative efforts of the USDA Forest Service, Intermountain Forest and Range Experiment Station; USDA Soil Conservation Service; Utah Division of Wildlife Resources; Nevada Division of Forestry; California Department of Fish and Game; California Department of Forestry; California Agricultural Experiment Station; Idaho Agricultural Experiment Station; Nevada Agricultural Experiment Station; and Oregon Agricultural Experiment Station.

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Description

'Lassen' antelope bitterbrush is unusual in its large size, uniform growth habit, and morphology of mature plants. Shrubs are upright with a spreading, leafy crown. Depending on site conditions, plants vary from 5 to 9 feet tall with crown diameters often exceeding the height. In early spring and summer, numerous solitary flowers and large achenes develop over the periphery of the crown on stems produced the previous years. Seeds ripen in early July and are quickly disseminated. In fall, fascicles of small, pubescent overwintering leaves replace the more abundant summer foliage. 'Lassen' tends to be leafier in fall and winter than many sources of antelope bitterbrush, which may account for its relatively high nutrient value during this season. On a dry weight basis, Welch et al. (1983) obtained in vitro protein content and digestibility value of 7.9 and 30.6 percent, respectively, for leaders collected in February. These were higher than values obtained for other sources of antelope bitterbrush and lower than Stansbury cliffrose or desert bitterbrush. Leaves constituted 15.1 percent of the new growth.

Origin and Development

In the 1940's, concern over deterioration of big-game and livestock ranges in northeastern California spurred researchers from the Pacific Southwest Forest and Range Experiment Station and the California Department of Fish and Game to begin investigations of antelope bitterbrush ecology and use of the shrub in range revegetation programs. In 1952, E.C. Nord made initial collections of 'Lassen' for inclusion in selection trials and seeding studies from stands near Janesville, Lassen County, California. The elevation at Janesville is approximately 4,200 feet with a mean annual precipitation of 14 inches. The temperature averages 49° F with summer highs of 100° F and winter lows of 15° F, although extremes of 106 and -17° F are on record. Associated species are basin big sagebrush, rubber rabbitbrush, and on moister sites, ponderosa pine (Nord 1965, Alderfer 1977).

In 1953, A.P. Plummer and A.T. Bleak obtained seed from the Janesville area for testing in Utah and Nevada. Plantings were extended to Idaho in 1956 by R.C. Holmgren. Interest in the characteristics and adaptability of this source led to

further studies by the Utah Division of Wildlife Resources and the Intermountain and Pacific Northwest Forest and Range Experiment Stations in Utah, Idaho, Oregon, and Nevada (Edgerton et al. 1983, Welch et al. 1983). The California Department of Fish and Game and commercial seed dealers annually collect large quantities of seed from the Janesville area for seedings in California and other western states. The site produces a considerable quantity of seed most years, and extensive plantings have been established using this source.

Uses and Adaptation

'Lassen' performs best on deep, coarse, well-drained, neutral to slightly acidic soils on sites from 3,000 to 6,000 feet in elevation. Pumice sites and coarse, granitic soils in northern California, central Idaho, and eastern Oregon are good sites for stand establishment. Areas of greatest adaptability are antelope bitterbrush-bunchgrass, ponderosa pine-antelope bitterbrush, mountain brush, and basin big sagebrush communities receiving from 12 to 24 inches of annual precipitation.

Vigorous seedlings and rapid growth make 'Lassen' a useful selection for seeding projects. Established stands provide valuable fall and winter forage for big-game animals and are heavily used by livestock. Under moderate to heavy grazing, 'Lassen' is highly persistent. It provides more available forage than low, spreading forms of antelope bitterbrush, particularly when a snow cover is present. Excessive browsing results in severe hedging and production of forage beyond the reach of browsing animals. The selection does not tolerate burning; root sprouting is rarely observed.

Because of its growth habit and unusual size, 'Lassen' can provide critical summer or winter cover for wildlife and livestock. It adds diversity to conservation and reclamation plantings and is an attractive, low maintenance shrub for roadways, campgrounds, and recreation areas.

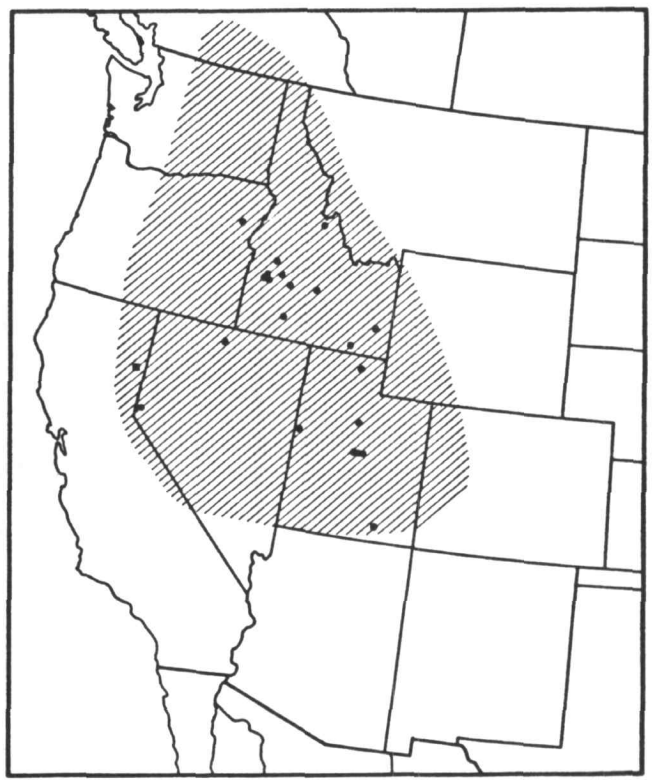
'Lassen' is especially well suited to planting with understory grasses and broadleaf herbs. Mixed plantings are extremely productive and can be grazed by livestock or wildlife. Mature stands of antelope bitterbrush do not reduce grass-herb production, but tend to increase forage yields, particularly of species such as intermediate wheatgrass and smooth brome.

Establishment

Small seedlings are sensitive to competition from grasses and weeds. However, 'Lassen' can be interseeded into established stands of grass or planted in conjunction with grasses and herbs if the seeds are planted in separate rows, strips, or spots at least 15 inches from adjacent grass rows. Seed should be planted about 0.5 to 1 inch deep in a firm seedbed.

Seeds are readily gathered and eaten by rodents. Consequently, seeding in the late fall or early winter reduces rodent predation and provides an adequate stratification period to break dormancy. Spring seeding requires pretreatment with hydrogen peroxide or gibberellic acid. Planting barefoot or container seedlings provides rapid establishment on sites that are difficult to seed.

Control of vegetative competition, rodent populations, and browsing during the first two growing seasons improves stand survival and accelerates development. On favorable sites, seeded plants begin to provide an adequate amount of forage in 3 to 5 years. Although young plants can withstand heavy browsing by big-game and livestock, growth is seriously depressed by excessive use.



Sites where 'Lassen' has been successfully established (•). Native stand (■). The variety is recommended for planting on adapted sites within the shaded area.

Maintenance and Availability

Seed harvested from wildland stands in an area between Doyle and Susanville, Lassen County, California, may be certified for commercial sales. Seed collectors should contact the California Crop Improvement Association, 231 Hunt Hall, University of California, Davis, California 95616 for information regarding certification procedures and costs.

Recognized classes of plant materials are foundation and certified seedlings. The California Department of Fish and Game maintains a population of parent plants on a site near Janesville. An orchard of foundation plants will be maintained by the Nevada Division of Forestry at the Washoe Valley Nursery, Carson City, Nevada.

Certified container seedlings for the establishment of certified seed orchards will be available from the Nevada Division of Forestry, 201 S. Fall Street, Carson City, Nevada 98701 in the fall of 1985. They should be planted on 10 foot centers with a minimum of 200 plants per orchard. With adequate care, plants begin to produce seed in about 3 to 4 years. Cultural information and recommended seeding prac-

tices may be obtained from the Nevada Division of Forestry or the Shrub Sciences Lab.

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Oak Consumption by Cattle in Arizona

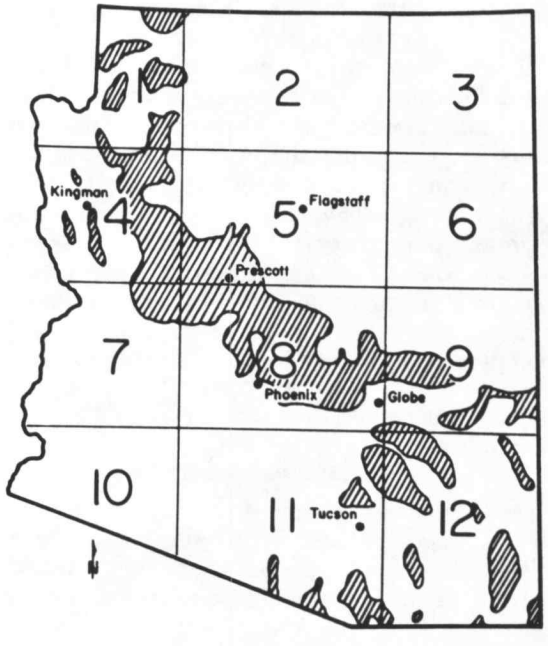
G.B. Ruyle, R.L. Grumbles, M.J. Murphy, and R.C. Cline

Cattle poisoning from consumption of oak leaves, buds, and acorns is widespread throughout the United States. The outbreak of oak bud poisonings that killed thousands of cattle in California during 1985 exemplifies the potential hazards that exist when livestock graze oak rangelands. Oak poisoning in cattle is generally a seasonal problem, occurring in the spring when new buds offer early green forage, and in the fall after acorns drop. The most likely toxic principles are tannic acids, or tannins. The level of toxicity is variable but poisoning problems can occur regardless of the plant part consumed (Kingsbury 1964, Panciera 1978).

Cattle can consume up to 50 percent oak buds and leaves in their diet without signs of poisoning but greater amounts lead to clinical toxicosis and death (Kingsbury 1964, Dollahite 1966). Tannin levels in oak may range from 2 to 6 percent (Dollahite et al. 1966). After ingestion, oak tannins are broken down into gallic acid and pyrogallol, chemicals toxic to cattle (Sandusky et al. 1977). Tannic acid toxicosis causes renal disease and subsequent kidney failure (Panciera 1978).

The initial clinical signs of oak poisoning in cattle include gauntness, listlessness, and constipation, followed by diarrhea, excessive thirst, and frequent urination (Kingsbury 1964). Rumen and renal function are reduced (Sandusky et al. 1977, Panciera 1978). Necropsy and histological findings are well-described (Sandusky et al. 1977, Panciera 1978), and should be easily recognized by a veterinarian. Histopathologic lesions are marked, and with the history of ingestion of oak leaves and necropsy lesions, a firm diagnosis can be made.

Oak consumption by cattle may also contribute to general unthriftiness of the cow herd long before the induction of classical signs of toxicosis since tannins have negative effects on forage digestibility (McLeod 1974, Provenza and Malechek 1984). High levels of condensed tannins in livestock diets may depress protein and fiber digestion (McLeod 1974). It seems likely, therefore, that moderate levels of oak consumption by cattle, while not inducing the classical signs



Shrub live oak distribution in Arizona. The twelve designated areas correspond to Table 1, and indicate general locations where cattle fecal samples containing oak were collected.

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Arizona Agriculture Experiment Station article 4081.

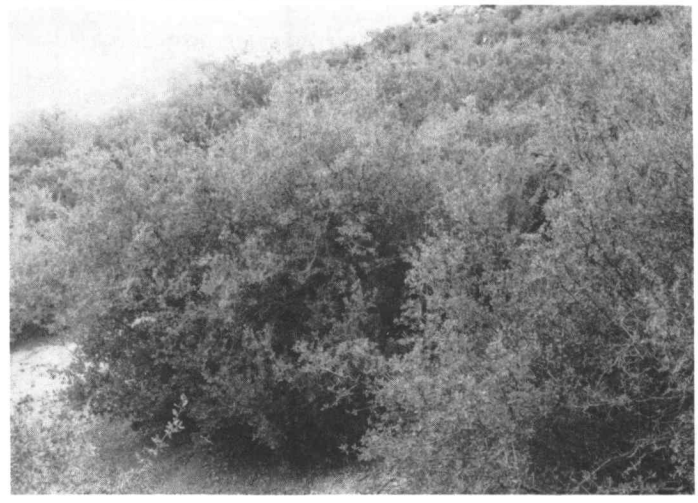
Table 1. Cases where more than 10 percent oak was found in cattle fecal samples analyzed from 1981 to 1985 by the Range Animal Diet Analysis Laboratory, University of Arizona.

Month	Area[1]	Number of cases	Oak species	$\bar{X}$ % in diet
January	1	3	*Quercus turbinella*	18
	4	5	*Quercus turbinella*	48
	5	1	*Quercus turbinella*	26
	9	1	*Quercus turbinella*	22
	11	1	*Quercus turbinella*	16
February	4	8	*Quercus turbinella*	45
	9	1	*Quercus turbinella*	12
	12	2	*Quercus turbinella*	34
March	4	2	*Quercus turbinella*	15
	5	1	*Quercus turbinella*	40
	12	2	*Quercus turbinella*	41
	12	1	*Quercus emoryi*	25
April	4	2	*Quercus turbinella*	38
	11	1	*Quercus turbinella*	49
	12	1	*Quercus turbinella*	12
May	1	3	*Quercus turbinella*	34
	4	1	*Quercus turbinella*	10
	9	1	*Quercus turbinella*	32
	12	1	*Quercus turbinella*	26
June	1	4	*Quercus turbinella*	13
	9	1	*Quercus turbinella*	15
	12	1	*Quercus emoryi*	13
July	4	1	*Quercus turbinella*	12
	9	1	*Quercus turbinella*	25
September	12	1	*Quercus turbinella*	12
October	9	1	*Quercus turbinella*	49
November	4	2	*Quercus turbinella*	17
	9	3	*Quercus turbinella*	44
	12	1	*Quercus turbinella*	52
	12	1	*Quercus hypo-leucoides*	12
December	4	2	*Quercus turbinella*	44
	9	3	*Quercus turbinella*	42

[1]Corresponds to one of twelve areas designed on map illustrated in figure 1.

of poisoning, may well reduce overall herd productivity on rangelands where oak is a major component of the vegetation.

Twelve species of oak occur in Arizona (Kearny and Peebles 1960), of which, shrub live oak *(Quercus turbinella)* has the widest distribution. Oak has been implicated in numerous cattle poisonings in Arizona but is also suspected of causing reduced performance in range cow herds where it is thought to become a diet mainstay during certain seasons. To better document oak consumption by cattle in Arizona, we consulted files from the Range Animal Diet Analysis Laboratory at the University of Arizona. From over 6,000 diet samples on record, 438 contained some level of oak. From these, we compiled 60 cases where oak was found to average at least 10 percent of the diet based on two or more samples submitted from one location. Single animal samples and diets of less than 10 percent oak were omitted. Recognizing the shortcomings of the fecal analysis technique and that the entire state was not evenly represented in the records, we feel the data offer insights into conditions whereby oak may be consumed by cattle in deleterious quantities.



Shrub live oak in Mohave County, Ariz.

The major oak species consumed by cattle in Arizona is shrub live oak. Primary areas where oak is seen in cattle diets are in northwestern and southeastern Arizona where major belts of oak occur although oak is present throughout the state. Secondary species include emory *(Quercus emoryi)* and silverleaf oak *(Quercus hypoleucoides).* These records show oak is an important diet constituent to cattle year around. Samples containing oak were collected in all months except August (Table 1). Cow diets in Arizona contained highest amounts of oak from December through April, ranging from 35 to nearly 40 percent. These levels, although not fatal, could seriously reduce cow performance. July, August, and September seem to be months when relatively little oak is consumed by cattle because the warm-season grasses provide the major forage on most Arizona ranges.

At low levels, oak is an important winter forage, but as tannin levels increase in cattle diets, roughage digestiblity may decrease. The subsequent reduction in energy and protein may cause problems not seen in seriously poisoned cows. Lower cow herd performance may manifest in decreased calf crops and calf weaning weights as has been witnessed on ranches in northwestern Arizona.

The obvious suggestion of using oak-free pastures is not helpful where entire ranches are covered with oak. However, oak-free pastures could be developed, ideally combined with the establishment of cool-season grasses. Although expensive, a good supplemental feeding program may be required during critical periods on ranches where oak poisoning is a problem. Calcium hydroxide, added to supplemental feeds at levels less than 10 percent, can prevent oak intoxication in cattle (Dollahite et al. 1966). The calcium hydroxide concentration must be low enough for the feed to be palatable but high enough to act as a tannin antidote. Calcium hydroxide is corrosive so care must be taken when handling the chemical.

Where oak is a problem on ranches, the critical periods when high oak consumption is most likely to reduce cattle performance must be identified. We recommend that ranchers provide cow fecal samples for analysis on a monthly or bi-monthly basis to estimate diet composition. Good grazing management, combined with a supplemental feeding pro-

gram, may then be developed to deal with problems.

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Succession in Pinyon-Juniper Vegetation in New Mexico

Martin R. Schott and Rex D. Pieper

Pinyon-juniper is a major vegetation complex of the southwestern United States. One-seed juniper and pinyon are the major species of the complex in central New Mexico. Since settlement of the Southwest by Europeans, this vegetation type has increased in distribution and density of individual trees (West et al. 1975). A decline in forb and grass production accompanied these increases (Johnsen 1962). Because of the decline in forage production, land managers have attempted various types of pinyon-juniper control, often without an understanding of the ecology of the complex or an idea of how the vegetation will respond to the treatment. For example, cabling has been used extensively in the Sacramento Mountains of southcentral New Mexico as a form of pinyon-juniper control. Larger trees are pulled out of the ground, but many smaller trees and shrubs survive the cabling. The successional pattern following cabling and other types of disturbance is not understood for many areas in New Mexico.

Research concerned with secondary succession of pinyon-juniper communities where one-seed juniper and pinyon are the dominants has not been extensive. This article presents the result of several studies on pinyon-juniper succession in the Sacramento Mountains in south central New Mexico.

Factors Influencing Succession

Soil depth and the amount of rockiness in the upper soil horizons have a major influence on succession after a community is cabled. Succession after cabling was examined on two different soils: a Lithic Haplustoll rock outcrop complex and a Lithic Haplustoll. Each soil supports a different association, and the successional pattern on each soil is different.

Most studies reported several stages of succession: forb, grass, grass-shrub, shrub and climax. Succession on the Lithic Haplustoll rock outcropping complex does not have the grass or shrub stages. Rocky, broken soils tend to restrict the vegetative spread of blue grama and wavyleaf oak, and other species that spread vegetatively. Thus, the grass and shrub stages are not evident on this type of soil. On deeper soils these stages do develop during succession (Table 1).

Shrubs and trees are restricted to soil patches between the rock outcrops. Because of the patchy soil, little interspecific competition for moisture occurs between the shrubs and trees, except for the patches of soil where wavyleaf oak and junipers occur. Because of the separation, wavyleaf oak is a member of the climax community on these soils.

Pinyon was the only tree that increased in coverage in the 28 years after cabling. Compared to junipers, it is a fast-growing species that produces seeds at younger ages. Both one-seed juniper and alligator juniper grow and mature slowly. Germination trials indicate young one-seed junipers produce seeds of low viability. Apparently, most juniper establishment after cabling is from seeds already on the site at the time of cabling, or seeds brought in by an animal vector. One-seed juniper seeds can remain viable for 20 years. Trees that become established require a minimum of 10-30 years of growth to produce seeds. Except for seeds that did not germinate and those brought in by animals, a seed source is not available until the established trees have matured. Lack of a continuous seed source and the slow growth of junipers accounts for the lack of increase in canopy 28 years after cabling.

Successional Patterns

The Lithic Haplustoll supported a pinyon-juniper/blue grama habitat type. Secondary succession of this habitat type after cabling is similar to the general successional models of Arnold et al. (1964) and Barney and Frischknecht (1974). Initially, the community is dominated by perennial grasses and forbs. An annual community may develop if perennial grasses were not common to the area before cabling. Shrubs such as wavyleaf oak and skunkbush gradually begin to dominate the grass-forb community, after which pinyons and junipers become established under the shrub canopy. Trees finally dominant the area. Rate of succession after cabling is faster than that proposed by the general models, but these were based on succession after catastrophic fire where more plants are destroyed.

Rate of succession after cabling depends on community

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Table 1. General pattern of succession on cabled pinyon-juniper woodlands on two soil types.

Original Conditions	Seral Stages 1	2	3	Climax
General successional model	Annual forb	Grass/forb	Shrub/grass	Pinyon-juniper
Lithic hapustoll	Annuals and perennials from seeds which disperse readily; surviving perennials.	Perennial grasses and forbs with establishment and spread of shrubs (esp. wavy-leaf oak)	Shrubs dominant; shade conducive to tree establishment.	Pinyon and juniper dominating. Pinyon eventually dominant.
Lithic hapustoll-Rock outcrop complex	Annuals and perennials from seed which disperse readily; surviving perennials.	These stages absent or poorly represented. Rock outcrops restrict vegetative reproduction.		Pinyon dominating Climax with juniper.

structure before cabling. If the community had a large canopy coverage of mature junipers and pinyons with few juvenile trees, and little or no wavyleaf oak or other shrub cover before cabling, succession will be slow. Heavy shading by trees and litter accumulation generally suppresses grass cover. Because of the initially sparse grass cover, the grass stage requires longer to develop. Scarcity of oaks before cabling results in the shrub stage taking longer to develop. Finally, the lack of young trees would result in fewer trees surviving the cabling. Trees that survive the cabling will produce seeds earlier than trees established after cabling.

Succession on Lithic Haplustoll soil depends on the species composition before cabling. If there is enough grass present, a grass stage develops quickly. A relatively complete grass cover slows the establishment of shrubs and trees. In contrast, a grass stage that developed slowly on an area with some shrub and tree cover after cabling will be short-lived. If an area does not have many shrubs, the shrub stage develops slowly. Age structure of the pinyons and junipers before cabling also influences succession. If there are many older trees and few young trees, cabling will destroy most of the trees. Except for the seeds already on the area before cabling, there would not be a seed source until trees that became established after the cabling have matured. Seeds from young trees are not highly germinable. Trees established after the cabling are from the seeds already on the area before cabling, or brought in by an animal vector. Thus, the shrub-tree and climax stages will require time to develop. However, if the stand had many young trees before cabling, more trees will survive the cabling and succession will have been much faster.

Interspecific Relations

Interactions among the species change as succession occurs. If a grass-forb stage develops without many shrubs or trees present, the grass interferes with establishment of shrubs and trees, except during favorable moisture years. A good grass cover limits shrub and tree establishment in most years by reducing the available space and moisture. During favorable growing years, shrub and tree seeds germinate and develop a root system that extends deeper than most of the grass root systems, ensuring rapid establishment (Johnsen 1962). If the grass-forb stratum were poorly developed, shrubs and trees are established more readily.

Junipers and pinyons usually become established under the canopy of a shrub or tree. However, one-seed juniper seldom gets established under another one-seed juniper. One-seed juniper litter appears to have an autopathic effect on seed germination. Burkhardt and Tisdale (1976) found that soil surface temperature on open areas can get hot enough during summer to kill the cambium of western juniper seedlings, resulting in mortality of the seedling. In contrast, soil surface temperatures under the canopy of a shrub or tree are not as high. Reduced soil surface temperatures may account for the establishment of pinyons and junipers under the crown of a shrub or tree. Pinyons do not appear to be sensitive to the chemicals in juniper litter because they are often found growing beneath junipers. Pinyons also appear to be more shade tolerant than one-seed junipers because young pinyons are often found in climax communities while young one-seed junipers are uncommon.

Competition for soil moisture between grasses and shrubs is greatest during germination and establishment of shrubs. However, after the shrubs are established, there would probably be some separation in their rooting zones, which reduces the direct competition for soil moisture. Wavyleaf oak, the dominant shrub on this habitat type, spreads vegetatively, forming oak patches. As the patches grow, the less shade-tolerant grasses die. These patches increase in size and height as the oak grows. Also, tree establishment in the wavyleaf oak patches occurs primarily during favorable growing years. Competition for soil water between the oak and the trees is greatest during initial establishment of the trees. After establishment, trees seem to have the competitive advantage over the wavyleaf oak.

Wavyleaf oak and one-seed juniper have higher water potentials on the more recent cablings than on older cablings. As the cabling becomes older, water potential of wavyleaf oak becomes more negative, and as the community nears climax the water potential becomes less negative. These data on plant water status suggest wavyleaf oak is a mid-seral species.

Water potential of one-seed juniper becomes more negative as the community gets older, reaching its most negative water potential in climax communities. These results, when combined with the fact that young one-seed junipers are seldom found in climax communities, indicate one-seed juniper is a late-seral species. On these shallow soils, roots of one-seed juniper and wavyleaf oak occurred at the same

depth and probably competed for soil moisture. One-seed juniper appeared to have the competitive advantage for soil moisture over oak.

Trees also have a competitive advantage for light because of their greater size. There appears to be little or no competition for soil moisture on deeper soils between wavyleaf oak and one-seed juniper. There may be a separation of rooting zones on deeper soils, while the rooting zones were similar on shallow soils because of the restrictive layer. Pinyons showed little or no difference in water potential in different seral communities. This lack of change in water potentials indicates pinyon was the climax species of the association. Also, young pinyons are often found in climax communities. There appears to be little competition for soil moisture between pinyon and the other species.

Succession in Tree Pits

Cabling destroys the larger pinyons and one-seed junipers by pulling them out of the ground. Uprooting the trees results in pits where the trees used to stand. Size of the pits is a function of tree size, soil depth, and parent material characteristics. Larger trees have larger root systems, which hold more soil and rock when trees are pulled from the ground. The amount of rock attached to roots determines the amount of soil removed when the tree was pulled out of the ground. Rock kept the soil from falling back into the pit when the tree was removed. The softness and the degree of fracturing of the parent material determines the amount of root penetration into the parent material, which affects how much rock is attached to the roots. Increased soil depth, up to a point, results in deeper pits. If the parent material is relatively deep, roots would not be attached to any rocks, and the soil will not stay attached to the roots, resulting in shallower pits. One-seed junipers have larger lateral root systems than pinyons, and cause largr pits when uprooted.

Plant succession in the pits follows the general successional models. However, in contrast to the rest of cabled area, succession in the pits takes much longer. When trees are pulled out of the ground, seeds under the tree are removed. Also, much of the soil profile is removed with the tree, leaving bare mineral soil of the lower soil horizons. Seeds have to get into the pits before plant establishment can occur. Plants with a good seed dispersal mechanisms probably occupy the pits first; these are probably annual forbs. Perennial forbs and grasses are established next in the pits. Succession here is a slow process. After 28 years, most pits have a perennial grass community and many are occupied by creeping muhly, a seral species. Shrub and tree establishment in pits is rare even after 28 years.

Management Implications

Succession after cabling of pinyon-juniper communities of south-central New Mexico is influenced by several factors: soil depth, degree of rockiness, and community structure before cabling. Rocky soils limit the spread of rhizomatous species and cause great variability in micro-climate over an area. Soil depth influences the species and their occurrence on a given area and the amount of competition between two or more species. Community structure before cabling, to a large degree, determines successional rate and direction. High grass coverage slows establishment of other species, and low grass coverage favors the establishment of other species. Low shrub cover before cabling results in the shrub stage being slow to develop, while high coverages result in a rapid development of the shrub stage. Stands with few young trees before cabling have lower successional rates than stands with large numbers of young trees. Finally, the species of the young trees influences succession. If the young trees are junipers, succession will be slower than if the trees are pinyons.

Successful conversions of pinyon-juniper communities depend on those factors that influence succession. Cabling pinyon-juniper communities that occurred on rocky shallow soil failed to result in a measurable increase in forage. Cabling pinyon-juniper stands that occurred on less rocky soils resulted in more forage being produced. However, over 28 years the increase has disappeared. Cablings on deeper soils generally resulted in more grass. However, if the stand had many shrubs or young trees before cabling, the gain would be shortlived. Therefore, to increase the success of pinyon-juniper conversions, stands should be selected with few young trees and shrubs, and at least 15% grass coverage. Also, cabling should be the first of two treatments. Fire, herbicide or some other method should be used as a secondary treatment about 5 years after cabling. Combination of the two treatments should result in a long-term pinyon-juniper conversion.

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Nebraska Range Management Cooperative Committee

Arnold J. Bateman, Patrick E. Reece, and Curtis W. Bates

Reductions in both State and Federal budgets have made it increasingly more difficult for agencies and institutions to provide adequate services and educational programs to Nebraska's range industries. Nebraska's rangeland resources provide one of the finest livestock producing areas in the world, abundant wildlife habitat and recreational opportunities. The health of Nebraska's rangeland has a direct influence on the State's water resources and agricultural economy. Each of these uses is important to the people of Nebraska and requires proper management to gain the maximum long-term benefits. Joint cooperation by agencies, organizations, and institutions that have management, service, and education responsibilities has provided an aggressive program for the care of rangeland resources that account for 52 percent of Nebraska's total land area. Fifteen Federal, State, and private agencies, organizations, and institutions including the Governor's Office have organized the Nebraska Range Management Cooperative Committee to help meet the challenge of providing assistance to the ranch industry. This Committee structure has allowed more open communication among each of the representatives and now provides a vehicle to facilitate joint cooperation in areas of common interest.

The Committee believes that it is possible to coordinate program efforts of different agencies, organizations, and institutions in areas of common interest to minimize overlap and maximize total efficiency. Coordinated efforts will improve quality of educational and technical programs and increase assistance to range resource users and owners. Current areas in which the Committee is working to increase cooperation include: sharing available educational and technical information through joint training programs, development of public awareness programs, and cooperative grazing management programs.

To develop this cooperation and increased program emphasis, the Nebraska Range Management Cooperative Committee has established the following goals:

1. Bring agencies, organizations, institutions, and individuals together who have major interest and/or responsibilities for range efforts in areas of shared concerns.
2. Foster cooperation at the State, District, Multi-County, and County level which will result in improving Nebraska's range resources, including but not limited to forage, soil, water, recreation, and wildlife components.
3. Cooperate in a manner which allows range management staffs to be more effective in assisting users of range resources.
4. Promote professional range educational programs by sharing research and training information and providing opportunities for joint publications.
5. Provide a forum within which agencies, organizations, and institutions can interact candidly and enthusiastically in the development and implementation of specific goals.

The Nebraska Range Management Cooperative Committee concept was initiated by repesentatives from the University of Nebraska Panhandle Research and Extension Center and Nebraska National Forest Service. The initiators of the Committee identified agencies, organizations, and institutions with major range responsibilities in Nebraska, and then asked each of the administrators for their support in organizing the Committee. A Joint Statement of Intent was prepared and a signing ceremony with various agency administrators was held at the Governor's Office. Signed copies of the Joint Statement of Intent were given to each signee to display in their office. Obtaining this administrative support has been vital to the success of the Committee because all participation is on a voluntary basis.

The Committee has adopted By-Laws and prepared Articles of Incorporation. The Committee By-Laws allow for each of the 15 agencies, organizations, or institutions to have one voting representative, appointed by their administrator, to serve on the Committee. Alternate representatives can be appointed by each administrator as needed.

Nebraska Range Management Cooperative Committee Members

Agriculture Research Division, University of Nebraska-Lincoln
Agricltural Stabilization Conservation Service
Cooperative Extension Service, University of Nebraska-Lincoln
Natural Resources Commission
Nebraska Association of Resources Districts
Nebraska Board of Educational Lands and Funds
Nebraska Branch-Center for Holistic Resource Management
Nebraska Department of Roads
Nebraska Game and Parks Commission
Nebraska Forage and Grassland Council
Nebraska National Forest
Nebraska Section-Society for Range Management
Nebraska Stock Growers Association
Soil Conservation Service
United States Fish and Wildlife Service, Region 6

In preparing the Committee's Plan of Work, all Committee members were asked to identify problems and/or opportunities where better coordination would be desirable. Four

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major areas of focus were identified and subcommittees organized to provide program leadership in: (1) public relations, (2) establishment of uniform stocking rate standards for Nebraska, (3) establishment of uniform seeding rate, technique, and species composition recommendations, and (4) compilation and publication of a Nebraska Range Management Directory.

Several public relation activities are ongoing. An official logo and letterhead have been adopted by the Committee. Increased participation by range professionals is being encouraged at the Nebraska Section-Society for Range Management Annual Meetings and Nebraska Stock Growers Association Annual Meetings. Range articles are being prepared for the Stock Growers magazine and other public media and more emphasis is being given to range exhibits at fairs and Stock Growers meetings.

The subcommittee for uniform stocking rate standards has prepared "A Guide For Planning and Analyzing A Year-Round Forage Program." This publication will serve as a basis for developing consistent stocking rate recommendations among all agencies in the State. Its use is optional, but will be promoted by the Nebraska Range Management Cooperative Committee as a means of standardizing stocking rates and animal unit equivalents. Work is continuing on the preparation of a Guide For Range Seeding Rates, Techniques, and Species. When this report has been completed, its use will be encouraged by the Nebraska Range Management Cooperative Committee as a means of standardizing uniform range rates.

A Nebraska Range Management Directory, listing professional range people, place of employment, education, training, and experience has been developed. The directory is a resource tool developed by the Committee to publicize and promote the use of range expertise that exists within Nebraska. The directory will be distributed by agencies throughout the State.

The Committee is one of several sponsors for the 1986 Nebraska-Kansas-Colorado Range Management Tour to be held on August 2, 1986, at Wauneta, Nebraska. All organizations who are members of the Nebraska Range Management Cooperative Committee will use this field day as their major 1986 Summer Range Tour.

Committee participants feel that the Nebraska Range Management Cooperative Committee is serving a useful purpose. We feel that the first 18 months of the Committee's existence have demonstrated that there are areas of common interest in which the different range related agencies, organizations, and institutions can work together. With continued support from administrators and Committee representatives, the Committee will increase its service to the range resource users of the State of Nebraska. ●

The Wyoming State Stewardship Program

Rod Miller, Jeff Powell, and Dan Rodgers

Wyoming has historically been a crucible where all the elements of range management have been mixed, often with explosive results. Natural resources issues usually generate strong feelings and a confrontational atmosphere. From the Johnson County range war in the last century to the Red Rim controversy today, competing interests have continued to fire away at each other. Only the weapons have changed. Combatants have exchanged six-guns and lynch ropes for lawsuits and political action committees. State government in Wyoming was often caught in the crossfire.

The seeds for the Wyoming Stewardship Program were planted in 1978 with the passage of the Public Rangelands Improvement Act (PRIA), Section 12, which authorized the federal Experimental Stewardship Program (ESP). Congress, cognizant of the divisive nature of public lands grazing issues, wanted to explore the possibilities of resolving these issues in a cooperative, coordinated atmosphere. The test case was the Challis area in Idaho. A coordinating committee was assembled and the experiment begun.

Meanwhile, back at the ranch in Cheyenne, Governor Herschler saw Section 12 of the Act as part of a solution to resource problems in Wyoming. Governor Herschler, realizing that an environment of cooperation was needed to promote wise resource decisions, drew components from the ESP and initiated the Wyoming Stewardship Program. The Governor gave the task of developing a program to the Wyoming Rangeland Management Coordinating Committee. The Committee is an advisory group composed of 35 members representing the various industries, agencies, and interest groups concerned with our rangelands.

The Committee got their marching orders in 1981 and worked diligently for a year developing guidelines for stewardship in Wyoming. It soon became clear that the program must satisfy two requirements: it must provide a conflict resolution vehicle and it must result in increased management efficiency. By late 1982, the profile of the Wyoming Stewardship Program was complete and ready for application.

There are similarities and differences between the federal Experimental Stewardship Program and the Wyoming Ste-

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wardship Program. Three basic goals, common to both programs, include the emphasis on compromise and consensus as conflict resolution tools, and integration of management efforts and an orientation toward grass-roots involvement. Equally important, both programs encourage flexibility in management and provide numerous incentives for the grazing permittee who is doing a good job.

The ESP applies stewardship to broad geographical areas encompassing multiple allotments. The Wyoming program identifies the ranch unit, including all deeded and leased lands, as the stewardship area with only one rancher involved in each individual program.

Another major difference is the origination and authority of the programs. The ESP is federally initiated and must be reported to Congress by 31 December 1985. The Wyoming Stewardship Program is a state program initiated by the Governor's Office in response to local needs. The Wyoming program is not constrained by federal congressional deadlines. In the spirit of cooperative management, the Govenor and the heads of the various public resource agencies have a gentlemen's agreement to do all within their power to ensure the success of the stewardship concept in Wyoming.

Once the Wyoming Rangeland Management Coordinating Committee established guidelines for stewardship, they solicited applications from Wyoming ranchers. Stewards had to meet several criteria. A steward was to be actively involved in the ranch operation and realize the majority of his income from livestock production. The ranch unit represented the mixed land ownership pattern prevalent in Wyoming, with BLM, FS, state, and private land. The rancher had a good record of management and had a reasonable chance of resolving any current resource conflicts.

Over 40 applications were received from ranchers who met the selection criteria. Applicants were ranked and Robert Grieve, Battle Mountain Company, Savery, was chosen as Wyoming's first steward in January, 1983.

The Battle Mountain Company offered many opportunities to test the value of coordinated planning in resource conflict resolution and for increased management efficiency. Bob ranches in both Wyoming and Colorado and on BLM, NF, state, and deeded land. He runs both sheep and cattle. Elk, pronghorn, and a migratory, interstate mule deer herd are very much a part of the ranch operation. He also shared a common BLM allotment with 3 other neighbors.

As outlined by the Wyoming Stewardship Program, a committee was formed in the spring of 1983 consisting of Wyoming and Colorado representatives from the SCS, BLM, FS, game and fish departments and from the Wyoming Agricultural Extension Service and UW Department of Range Management. Some of the Colorado agencies gave their proxy to their Wyoming counterparts and some Colorado agency reps took a direct and active part in committee activities. Representatives of other groups (e.g., Wyoming Department of Agriculture) participated, but on a less consistent basis. At this point, the position of Range Resource Analyst was added to the Governor's staff with the job description stressing coordination of the Wyoming Stewardship Program.

One major consideration in the establishment of Wyoming's stewardship areas was to conduct the program using an Extension principle, education by example. The Committee believed everyone actively involved in the Program would learn by doing, and those watching from across the fence would see the stewardship concept in action, hopefully resulting in further support for the idea. Our objective was to re-introduce to the State an old, neglected cooperative means of decision making (i.e., coordinated planning) to break out of the existing confrontational mode.

The organization of a local Wyoming stewardship committee closely resembles that of the Experimental Stewardship Program, but with fewer members. The stewardship committee is composed of the rancher and resource agency personnel and interest group representatives from the local level who are familiar with the land involved and have first-hand knowledge of any resource conflicts. Involving individuals with these qualifications results in grass-roots, or bottom-up input to the decision-making process and minimizes the risk of arbitrariness.

Committee dynamics are integral and critical components of the process. Committee members are encouraged to be open and honest during discussions, to avoid value judgements, and to seek and offer compromise. Decisions are not made by vote but rather through consensus, after all options have been examined.

A consensus approach ensures that everyone involved has equal influence over the decision and that no "minority report" need be written. While consensus building takes time, the product represents the collective will of all participants and remains in effect much longer than the decision of a vote. Several meetings may be necessary to develop the atmosphere of trust essential to reaching a consensus. However, stewardship committees should keep in mind the adage "There is seldom enough time to do it right, but always enough time to do it over." In this light, the stewardship process facilitates the best efforts of local interests to identify and resolve resource problems before they fester into full-blown crises with consequent polarization of positions.

A stewardship committee follows the classical guidelines of the planning process, asking the questions "Where are we?", "Where do we want to go?", "How do we get there?" and "Did we make it?" The steps usually involve collection of available resource data, summation of the historical operation of the ranch unit, and identification of resource problems and conflicts and management efficiency opportunities. With this information in hand, the committee develops goals and objectives tailored specifically to the stewardship area and a plan of action to attain those goals.

Generally a plan develops with both long and short-range components. Long-range goals may be improved management efficiency, increased profit, improved livestock and wildlife habitat and/or reduced time spent on conflicts. Short-range objectives may be physical improvements and management operations adjustments needed to *reach long*-range goals. These short-range objectives provide a yardstick with which the committee can assess progress. Stewardship goals and objectives are articulated in the plan, a document that takes about a year to produce.

These are the philosophies, policies and procedures used by our current Wyoming stewardship committees. Bob Grieve's committee has produced a written plan with long-range goals and short-range objectives. Some of the accomp-

lishments are particularly significant. Two of the BLM allotments were combined; a cross-fence (meeting Wyoming Game and Fish Department specifications for antelope) added with the SCS rep on the transit, the BLM rep holding the rod, and the Grazing Board providing the wire; and a grazing system implemented to improve grazing distribution, the use of temporary water and to resolve some of the conflicts common in common allotments.

One of Bob's sheep allotments on the Routt National Forest was changed to a cattle allotment because of the present poor return from sheep and to use cattle to increase the forb component of the vegetation for better deer forage. The wild horse problem has been addressed, even if it has not been solved. After working together on Bob's committee, representatives from the Wyoming and Colorado Game and Fish departments are now trying to coordinate management of the interstate mule deer herd in the area.

Gary Rice of Ten Sleep, Wyoming, was selected as the second steward. Gary also operates on deeded, BLM, NF, and state land, but with some problems different from those of Bob Grieve. Gary moves his cattle from BLM/private spring range to NF summer range. A late spring means staying too late on spring range or moving onto the summer range before range readiness. Gary's committee designed a deferred grazing scheme and added crested wheatgrass pasture on his BLM/private spring range to increase spring forage as a buffer against late or poor spring growing conditions. By having Gary and the BLM and FS reps on the same committee, there is also greater understanding and cooperation concerning turn-off/turn-on dates and management flexibility.

In one large pasture in good condition but with relatively poor grazing distribution, Gary leased out grazing rights for a band of herded sheep. These sheep now concentrate on the underutilized areas. There are some riparian zone problems because of concentrated grazing on his NF allotment. Some of these areas are noticeably in view of a major highway. With assistance from watershed and riparian grazing scientists from the University of Wyoming Department of Range Management, new grazing schemes are being designed to use cattle grazing to improve the condition and appearance of the riparian areas.

In an effort to increase an awareness and understanding of the Wyoming Steward Program and to provide training in coordinated planning, Tim Leftwich (former Ranch Resource Analyst from the Governor's Office), Dan Rodgers and Jeff Powell conducted a series of 7 stewardship workshops on a whistle-stop tour around the State in January, 1984. Possibly as a result of the workshops and stewardship program, there is a growing number of coordinated resource management programs (CRMP) in Wyoming. The CRMP process will accomplish the same results as the Wyoming Steward Program if resource managers will just try it in good faith. Additional stewards and CRMP cooperators are encouraged to apply.

What is the relationship between the stewardship plan and an allotment management plan? Are they analogous or do they conflict? The stewardship process is not an attempt to circumvent, but rather to facilitate the federal agencies' planning processes.

The U.S. House of Representatives Committee on Interior and Insular Affairs Report of 10 May 1978 accompanying PRIA stated: "For example, under the Experimental program required in Section 5(c) of the Bill, the Secretaries could use their authority not only to experiment with lower grazing fees as an incentive to range improvement, but may also refrain from implementing AMP's on lands where operators are currently doing a good job of managing the lands. This is entirely consistent with their discretionary authority in FLPMA and H.R. 10587 to determine that AMP's are not necessary or appropriate for certain lands. The committee hopes the secretaries will use both these and other options to promote the best possible range management and improvement programs."

Thus it seems the intent of Congress is that a stewardship plan will enjoy considerable stature in the agencies' planning process and a Secretary has the discretion of substituting locally initiated plans for agency initiated documents where he deems appropriate. In addition, when documents are the result of a state initiated program such as in Wyoming, they must be considered in the planning process as such. FLPMA, PRIA and agency planning regulations mandate that, where practical, federal actions must be consistent and compatible with such state adopted plans.

Those involved in this effort believe a stewardship program properly and diligently applied is a win-win situation. When everyone affected by a decision has the opportunity to substantively influence that decision, when a diversity of interests can overcome their differences and reach consensus on a course of action, and when these activities result in a program applied on the ground, nobody loses and the ultimate beneficiaries are the range resources themselves. ●

Mule and Black-tailed Deer Award

The Western Deer Group and the family of the late Dr. O.C. "Charlie" Wallmo have announced the establishment of the O.C. "Charlie" Wallmo Award providing for the "recognition and commendation of outstanding contribution(s) to knowledge and improved management of mule and black-tailed deer."

The O.C. "Charlie" Wallmo Award will consist of a bronze mule deer sculptured by his son, Joe B. Wallmo of Drake, Colorado. The award will be presented biennially in conjunction with the Western Deer Workshop

Nominations for the first award, to be presented at the 1987 Workshop, should be sent to Dr. Richard J. Mackie, Chairman, O.C. "Charlie" Wallmo Award Committee, Dept. of Biology, Montana State University, Bozeman, MT 59717. The nominations, which will be accepted through September 30, 1986, must include: (1) a brief justification and resume of the qualifications of the nominee, (2) copies of appropriate reports/publications, and (3) supporting letters from at least two other individuals familiar with or capable of objective assessment of the merits of the nominee and the contributions upon which the nomination is based. Both short-term and long-term contributions will be considered. Additional information may be obtained from the Chairman or Committee Members Len Carpenter, David E. Brown, George Tsukamoto and John W. Schoen.

Current Literature of Range Management

This section has the objective of alerting SRM members and other readers of *Rangelands* to the availability of new useful literature being published on applied range management. Readers are requested to suggest literature items—and preferably also contribute single copies for review—for including in this section in subsequent issues. Personal copies should be requested from the respective publisher or senior author (address shown in parentheses for each citation).

Body Condition, Nutrition, and Reproduction of Beef Cows; by Dennis B. Herd and L.R. Sprott; 1986; Texas Agric. Ext. Bul. 1526; 11 p. (Bulletin Room, College of Agric., Texas A&M Univ., College Station, Texas 77843) Outlines a system for evaluating the beef cow's body reserves for use in improved management and feeding decisions.

Control of Big Sagebrush *(Artemisia tridentata)* with Pelleted Tebuthiuron; by Kirk C. McDaniel and John F. Balliette; 1986; Weed Sci. 34(2):276-280. (Anim. & Range Sci. Dept., New Mex. State Univ., Las Cruces, N. Mex. 88003) Compared the effectiveness of different tebuthiuron formulations and rates for big sagebrush control and understory improvement at five sites in northern New Mexico.

Deer-Proof Fencing; by Sheila F. Roberson (Ed.); 1985; Caesar Kleberg Wildl. Res. Inst., Kingsville, Texas; 41 p. (Texas A&I Univ., Campus Box 218, Kingsville, Texas 78363; $1.60) A discussion by eight authors on the methodology, practicality, and management ramifications including animal genetics of producing deer under deer-proof fence.

Diets of Four Wild Ungulates on Winter Range in Northcentral New Mexico; by Thor E. Stephenson, Jerry L. Holechek, and Charles B. Kuykendall; 1985; Southwestern Nat. 30(3):437-441. (Animal & Range Sci. Dept., N. Mex. State Univ., Las Cruces, N. Mex. 88003) Compared the botanical diets and dietary overlaps of wild horses, mule deer, elk, and pronghorn on low elevation winter range.

An Evaluation of the Forest Service and Bureau of Land Management Grazing Appraisal Report; by Darwin B. Nielsen, E. Bruce Godfrey, and Frederick Obermiller; 1985; Utah Agric. Expt. Sta. Res. Rep. 104; 58 p. (Bulletin Room, College of Agric.; Utah State Univ., Logan, Utah 84322) A review of a previous USDA-USDI report in which the validity of the previous findings were questioned.

Fee-Hunting on the Public's Lands?—An Appraisal; by Jack Ward Thomas; 1984; Trans. N. Amer. Wildl. and Nat. Resources Conf. 49:455-468. (U.S. For. Serv., Pacific Northwest For. & Range Expt. Sta., La Grande, Ore. 97850) A discussion of the pros and cons of extending fee hunting on private lands to public lands as well.

Feeding and Managing Livestock During A Feed Shortage; by J.E. Knipfel, G. Grigat, and S.E. Beacom; 1984 (Rev.); Agric. Can. Pub. 5231; 22 p. (Agric. Canada, Ottawa, Can. K1A 0C7) A practical guide to common feeds and by-products for maintaining producer flocks and herds during feed shortages including drought.

Compiled by John F. Vallentine, Professor of Range Science, Brigham Young University, Provo, Utah 84602

A Fifteen-Year Phenological Record of Pasture Plants near Lincoln, Nebraska; by Melvin K. McCarty; 1986; Weed Sci. 34(2):218-224. (USDA, Agric. Res. Serv., Lincoln, Neb. 68583) Reports observations of the occurrence of selected growth stages of 65 pasture plants and discusses their relationships to seasonal and annual temperature/precipitation differences.

Game Ranching: Threat to Wildlife Conservation in North America; by Valerius Geist; 1985; Wildl. Soc. Bul. 13(4):594-598 (Univ. of Calgary, Calgary, Alta. T2N 1N4) A generally unfavorable philosophical review of projected game ranching in Alberta.

Habitat Management for Sage Grouse in Nevada; by Donald A. Klebenow; 1984-1985; World Pheasant Assoc. J. 10:34-46. (Dept. of Range, Wild., and For., Univ. Nev., Reno, Nev. 89557) Applied habitat management is discussed under sage grouse populations, habitat requirements, significance of meadows, and relationship to grazing.

Integration of Beef Cattle Reproduction and the Range Resource; by R.A. Bellows; 1985; Amer. Soc. Anim. Sci., West. Sect. Proc. 36:1-3. (USDA, Agric. Res. Serv., Fort Keogh Livestock & Range Res. Sta., Miles City, Mon. 59301) Discussed the key events in the reproductive cycle of the beef cow and related them to the availability of nutrients from range forage.

Maximizing Stocking Rates with Common-Use and Proper-Use Grazing; by Jack R. Nelson; 1985; Wash. Agric. Ext. Bul. 1356; 6 p. (Bulletin Room, Agric. Res. Center, Wash. State Univ., Pullman, Wash. 99163; 25¢) Suggests formula modifications to expedite the use of A.D. Smith's method (JRM 18:196-201) of determining common use grazing capacities.

Meadows in the Sierra Nevada of California: State of Knowledge; by Raymond D. Ratliff; 1985; USDA, For. Serv. Gen. Tech. Rep. PSW-84; 52 p. (Pacific Southwest For. & Range Expt. Sta., P.O. Box 245, Berkeley, Cal. 94701) Summarizes available information on maintenance, restoration, and management of said meadows.

A Model for Predicting Trends of New Mexico Grazing Land Values; by L. Allen Torrell and John M. Fowler; 1986; N. Mex. Agric. Expt. Sta. Bul. 723; 29 p. (Bulletin Room, College of Agric., N. Mex. State Univ., Las Cruces, N. Mex. 88003). Describes the current New Mexico ranch real estate market as indicated by recent ranch sales, and constructs statistical regression models which estimate the time trend of ranch selling prices.

New Grasses for Intermountain Rangelands; by K.H. Asay, W.H. Horton, and W.T. Hansen II; 1985; Utah Sci. 46(4):119-123. (Bulletin Room, Agric. Exp. Sta., Utah State Univ., Logan, Utah 84322) A progress report on developing improved cultivars of crested wheatgrass, Russian wildrye, and interspecific hybrids involving wheatgrasses, wildryes, and related species.

Nutritive Value of Forage Collected by Esophageal Fistulated Cows in Riparian and Upland Areas on Forest Land; by J.P. Neel, H.E. Kiesling, G.B. Donart, J.L. Holechek, et al.; 1985; Amer. Soc. Anim. Sci., West. Sect. Proc. 36:304-306. (Anim. & Range Sci. Dept., N. Mex. State Univ., Las Cruces, N. Mex. 88003) Although forage ingested on the riparian sites was found more nutritious than that on the upland sites in August and October, both sources were considered nutritionally adequate.

Performance of Switchgrass and Bluestem Cultivars Mixed with Cool-Season Species; by G.A. Jung, J.L. Griffin, R.E. Kocher, J.A. Shafer, and C.F. Gross; 1985; Agron J. 77(6):846-850. (U.S. Reg. Pasture Res. Lab., Univ. Park, Pa. 16802) Found that warm-season grasses could be mixed with cool-season grasses to enhance mid-summer production and thereby achieve a more uniform seasonal yield distribution, particularly when grazed to favor the warm-season grasses.

Pinyon-Juniper Woodland Type in New Mexico: Asset or Liability; by John M. Fowler, Bruce E. Peacock, and Michael J. Schaber; 1985; N. Mex. Agric. Expt. Sta. Bul. 718; 67 p. (Bulletin Room, College of Agric., N. Mex. State Univ., Las Cruces, N. Mex. 88003). Potential uses of the pinyon-juniper woodland type were modeled to determine potential revenue patterns and concurrently enhance the woodland resource.

Planting Date Effects on Seedling Development of Perennial Warm-Season Forage Grasses; by F.H. Hsu and C.J. Nelson; 1986; Agron. J. 78(1):33-38, 38-42. (Dep. Agron., Univ. Mo., Columbia Mo. 65211) Study included big bluestem, Caucasian bluestem, Indiangrass, and switchgrass; Part I, Field Emergence; Part II, Seedling Growth.

Proceedings—Symposium on the Biology of *Artemisia* and *Chrysothamnus*, Provo, Utah, July 9-13, 1984; by E. Durant McArthur and Bruce L. Welch (Comp.); 1986, USDA For. Serv. Gen. Tech. Rep. INT-200; 398 p. (Intermtn. For. & Range Expt. Sta., 507 25th St., Ogden, Utah 84401) Topics addressed by the 54 papers include distribution, systematics, genetics, revegetation and control, animal relationships, ecological relationships, diseases and insects, and physiology.

Productivity of Different Biological Types of Beef Cattle Under Montana Range Conditions: An Introduction; by Don Kress, Don Doornbos, and Don Anderson; 1986; Mon. AgRes. 3(1):1-3. (Bulletin Room, Mon. Agric. Exp. Sta., Bozeman, Mon. 59717) The first of a consecutive series of eight articles (pages 1-8) by these authors and colleagues presenting the results of research on the maternal performance of different biological types of beef cattle under Montana range conditions.

Short Duration Grazing Cell Parameters and Cattle Production: A Low Resolution Model; by R.L. Senft and J.C. Malechek; 1985; Amer. Soc. Anim. Sci., West. Sect. Proc. 36:282-285. (Ani. Sci. Dept., Utah State Univ., Logan, Utah 84322) Used a model based on grazing yearling heifers on spring crested wheatgrass range to explain grazing system effects on cattle productivity.

Soluble Carbohydrates, Concurrent Photosynthesis, and Efficiency in Regrowth Following Defoliation: A Field Study with Agropyron Species; by J.H. Richards and M.W. Caldwell; 1985; J. Appl. Ecol. 22(3):907-920. (Dept. Range Sci., Utah State Univ., Logan, Utah 84322) This field study showed that photosynthesis of regrowth following partial plant defoliation was much more important than storage carbohydrates for shoot regrowth.

Vegetation Changes on Western Rangelands; by Farrel A. Branson; 1985; Soc. Range Mgt. Range Mono. 2; 76 p. (Soc. Range Mgt., 2760 West Fifth Ave., Denver, Colo. 80204 A synthesis of the literature directed towards determining the direction, extent, and causes of changes in western North American rangeland vegetation during the past 100 years.

Wool Production in Canada; by J.A. Vesely; 1984; Agric. Can. Pub. 1763/E; 22 p. (Communications Branch Agric. Canada, Ottawa, Can. K1A 0C7) A practical review of the production, harvesting, and marketing of wool.

Legislative Log

The 99th U.S. Congress has a full agenda for the remaining months. In addition fall elections are not too far away. It appears that many important issues will get slighted because of the budget and deficit issues plus foreign affairs and other subjects. Following are a few bills of significance and highlights on a few of the important issues.

Natural Resource Budgets: 'We're Writing our Future Today"

"Unless the Congress acts to prevent them, the President's increasingly restrictive budget allocations for natural resource agencies—working in concert with the deep budget cuts potentially involved in the Gramm-Rudman exercise—will completely dismember the vital federal programs which manage and conserve our nation's forests and other natural resources," warned AFA Executive Vice President Neil Sampson at recent Congressional appropriations hearings. It all boils down to this: after crediting receipts for such things as timber sales and minerals, the President has once again proposed to spend a net of only about one-half of one-tenth of one cent of each federal dollar for the management of public lands and conservation programs directed to private lands.

After examining these figures, we concluded that "the current situation, when viewed in the total context of the trends for the past decade, the impending budget reductions of Gramm-Rudman, and the needs of the Nation for maintaining the sustainable productivity of the natural resource base, calls essentially for a budget that is frozen at 1986 levels in virtually every category." As Neil Sampson put it, "Those who would call for a reduction in natural resource conservation efforts now, with the assurance of their eventual restoration when 'better times' arrive, are dangerously shortsighted. And those who insist that federal forestry and conservation agencies and programs must continue to share the deficit-reduction burden understand neither the dynamics of these agencies or of the federal deficit."

AFA maintains that the resource budget and policy decisions Congress makes in 1987 will fundamentally shape our forestry and land mangement programs for the next two decades, as our nation wages what is certain to be a long and painful war against the federal deficits that have amassed in recent years. "We are writing our future today," stressed Sampson. "We believe that the well-being of America's people is closely tied to the productivity of the land, water and forests. The careful management of public and private lands benefits everyone—either through the forest, mineral, energy, farm and range products these areas produce, the cleaner air and water that flows from well-managed lands, or by the very thought of the magnificent land heritage they jointly share with all U.S. citizens."

So we always feel like we are stuck in a dilemma when it comes to funding positions. Nobody wants to sound irresponsible abut the need to hold down spending. But spending alone, is not the problem in Washington these days. We have billions to send after the high priorities and conservation of our natural resources should be among them.

AFA-Resource Hotline

Bill No.	Description of Bill	Status of Bill as of April 29, 1986
S-2245 Senator Lugar (R. Ind.)	Reauthorization of the Federal Insecticide Fungicide and Rodenticide Act (FIFRA).	Two hearings were held in April to hear evidence on S-2245 and other bills if there are any. Markup on a Senate bill is tentatively scheduled for June.
HR-1650 Rep. Madigan (R-Ill.) Rep. Waxman (D.-Cal) S 124 Sen Durenberger (R-MN)	The Safe Drinking Water Amendments of 1985.	Passed House and Senate, currently in conference, expected to be completed soon.
HR-8 Rep. Howard (D-N.J.) Rep. Roe (D.-N.J.) Rep. Strangeland (R.-MN) Rep Snyder (R-Ky.) S-1128 Senator Chaffee (R-R.I.)	The Water Quality Renewal Act of 1985 (House) The Clean Water Act Amendments of 1985. (Senate)	Passed House and Senate. Awaiting conference committee report which is expected upon completion of Superfund conference.
H.R. 2817 H.R. 2005 Rep. Howard (D.-N.J.) Rep. Roe (D.-N.J.) Rep. Florio (D.-N.J.) Sen. Stafford (D. Vt.) Sen. Lautenberg (D.-N.J.)	The Superfund Improvement Act of 1985. A bill to renew and strengthen the 1980 Superfund Act placing stringent regulations on time and quality of cleanup procedures.	Passed House and Senate. Now in conference; committee not likely to conclude until May or later.

Interchange's Best Friend, McClure, Not Pleased by Agencies

The BLM and Forest Service proposal to interchange 25 million acres of land has gotten off to an inauspicious start on the Hill.

The best friend of interchange, Sen. James McClure (R-Ida.), who will have to carry the administration's water if a bill is to do anything, is less than pleased that he wasn't consulted about the administration's final product. A draft bill was presented to the Hill February 19.

Normally McClure would introduce the administration bill "by request" without a quibble; this time he has Senate lawyers combing the measure and the Senate Energy Committee staff reviewing boundaries with individual state delegations. Nevertheless, "McClure likes the concept," said a committee staff member. "He really likes the idea."

The assumption on the House side is that the Senate will take the lead. "My idea is we'd be wasting our time if we held hearings and started to work on a bill and then have one or two senators stop it," said a House Interior Committee staff member. "We'd be better off waiting for the Senate."

Although there is a distinct lack of enthusiasm for the proposal on the Hill—"It's a lot of fuss to save $15 million for two agencies with a $2 billion budget," said one aide—there is not a lot of strong antagonism either. Except maybe for Sen. Melcher (D-Mont.). He has been outspoken in saying the thing is a waste of time.

And there is the problem. Because the administration bill is offered as one undigested lump rather than state-by-state, individual senators such as Melcher with their noses out of joint can stop the whole thing. "I thought they (BLM and the Forest Service) would be intelligent enough to do it state-by-state and trust us to pass the individual bills fast *enough*," said one Democratic staff member.

As had been presaged by drafts of the interchange proposal, the final product backed off on transferring most of the O&C lands from BLM to the Forest Service. It also bowed to pressure from Arizona, Nevada, and Wyoming not to close down national forests there and not to transfer forest land to BLM.

The administration bill does retain a provision to transfer responsibility for management of subsurface minerals from BLM to the Forest Service.—Public Lands News

President's Notes

Gazing into the Foggy Crystal Ball

Dear Friends,

How time flies! Some in the SRM may think that I died (or quit). I am happy to say that this rumor is greatly exaggerated. However, March and April have been very busy months.

Beginning on March 16th, I and others in the College of Agriculture Administration at the University of Wyoming began a five-week tour of the state. We visited every University Extension Service Office and spent a day in most counties visiting with Extension personnel and clientele. I'd like to share with you what I've learned about rangelands and range management.

The first observation I would make is that there are fewer cattle and sheep in Wyoming than I have noticed in my seven years in the state. Certainly the rotten market for beef products is one reason that cattle numbers are down. Everywhere we traveled, people talked about not being able to sell their cattle at a profitable price. Likewise, everywhere we traveled, people were excited to hear about innovative marketing ideas such as lean beef produced mostly on range and pasture forage and without growth hormones. This is the kind of product that our health conscious society seems to desire.

This trend has implications for rangeland management. This trend points to the importance of forage producing lands as a critical part of our food supply system. It probably means that animals will stay on range and pasture longer to gain sufficient weight for processing. Some breeding animals will be removed from range to provide an adequate and nutritious diet for the slaughter animals. These slaughter animals will be younger and more able to distribute themselves over the range. Range managers will be challenged to provide proper management strategies for this new animal population mix.

Every time we talked to sheepmen, we were told about the problems that predators (particularly coyotes) caused. We heard many graphic descriptions of the number of lambs lost and the difficulties of predator control. This situation has bothered me for a number of years because I have seen ranchers converting from sheep to cattle. This conversion has caused grazing management problems because the grazing behavior of the two animals is different. If we lose sheep as a component of our range animal mix, then we will have lost some of our ability to manage range properly. I *think* range managers and SRM members should be concerned about this. Surely there is a way to balance predators with the environment as we balance grazing animals with the available forage supply.

Another reason that the current cattle and sheep numbers are down in Wyoming is that the spring, summer, and fall of 1985 were very dry in many parts of the state. Some ranchers sold their herds and others rented pasture in other states. drought has always been a concern of range managers. We often wonder: If past management had been better, would the effect of the dry season have been as bad? What is the effect of continued grazing on plants that are under severe stress?

What is the proper post-drought grazing management strategy to insure rapid recovery from the drought? These are but a few of the questions we have wrestled with since the beginning of our profession. Continued research is needed to provide us the ability to manage the effects of drought properly.

The last rangeland management trend we found in Wyoming during our tour was an increasing interest among ranchers and their families to use the ranch resources in innovative ways. People talked about leasing hunting and fishing rights on private lands and providing private camp sites and other hunter-fisherman related services in public land areas. We had ranch housewives ask us about providing bed and breakfast accommodations in their vacant bedrooms and bunk houses. I think it very important for SRM to pay attention to this trend because new uses of the land will result in new impacts that range managers will have to manage. Also, I think it imperative that we help people who grew up on the land and who understand land management to stay on the land. A tremendous knowledge base is tied up in our ranchers and their families. If they lose the ranch because they cannot make a living, then someone else who does not have the same knowledge will buy the land and figure out how to use it to make a living. I personally believe we already have too many "off-road vehicle race ranches" and too many "subdivision ranches." Thus, I believe we need to be involved in this new trend for economic use of the land so we can help prevent serious impacts and help people who understand the land, stay on the land.

I could write much more because we met over 1,500 people on the tour. I think this is enough information, however, to convey my message: People from all walks of life are interested in rangelands and range management. Our management will become more complex as new uses become important. This is particularly true as we find ourselves dealing with more and more people.

It is difficult to see accurately what lies in the future for rangelands and range management but there is little doubt in my mind there will be much to be done in the future. The ball is in our court to prepare the Society and to become individually prepared for future challenges and opportunities.—**Fee Busby,** President, SRM

Drought Symposium

Improving our international capacity to respond to drought is the theme of the "International Symposium on Drought: Prediction, Detection, Impacts Assessment, and Response" to be held September 29-October 1, 1986, at the University of Nebraska, Lincoln.

Commissioned papers from an international roster of distinguished experts will address the physical and societal implications of drought on a variety of spatial scales, from the farm level to supernational regions.

Contact Dr. Donald Wilhite, 241 L.W. Chase Hall, University of Nebraska, Lincoln, NE 68583-0728, telephone: 402 472-6707.

The Executive Vice-President's Report

I'm just about to take a big chance and leave my overshoes at home on the possibility that spring or summer is here at last. Believe it or not, since October 23rd there has been snow on the ground either at home at the ranch in Montana or here in Denver. In a wild moment when the plastic sack that contains my overshoes, cap, and gloves in my suit case wore out, I left them at home. What does this mean? Well for one thing, work with rangelands takes you to every clime from the arctic to the desert and all variations in between.

The myth that the rangelands are those lands west of the 100th meridian dominated by livestock and cowboys is a complete fallacy. Perhaps one of our highest priorities in the Society should be to make every effort to inform the general public what rangelands are, what their uses are, and what the products are that can be found on or used from the lands. To me, this is a very serious charge to our professional Society and should be foremost in our minds at all times.

It is a large job to compile the minutes of our Annual Meetings, but they are now out to the Board of Directors, Committee chairmen, and appropriate Section people. If you wish to review a copy, simply contact one of those people or call the Denver Office and we will make every effort to answer any questions you might have. Because the agendas were so full and the volume of business was large, we simply can't send everyone a copy; but please review the article in this issue of *Rangelands* that recaps the important items. If you feel that a copy is necessary, then we will gladly make you one at our cost for duplicating and mailing.

Following the line of thought in this report that the rangelands can be found nearly everywhere, it seems that your Executive Vice-President can be found in the same way. My travels to represent you and the resource that we are dedicated to have taken me to a wide variety of meetings and conferences, both within and out of our Society.

For example I represented you at the North American Wildlife Institution Annual Meeting in Reno, Nevada, with First Vice-President Jack Miller and a good group of range people. The Institution had a full session on Range Management this year, which we were pleased to see. But as I told them at their planning session for 1987, they have barely put a toe in the water, so to speak, and we hope now that the door is open a crack so they may continue this effort.

I went to Washington D.C. to work with our new representative Ray Housley. Ray, Ted Lucas, (a long standing member), and I followed a heavy schedule of meeting with people in the agencies, Congress, and private organizations introducing Ray and emphasizing the important point that he will continue the involvement established by Clare Hendee, our former representative, and try to increase our presence in the Washington scene. Frankly, the bottom line is that recently there has been a great deal of attention given the rangelands with various attempts to write legislation, and far too often it was based on poor, incomplete, or inaccurate information on the subject being addressed. This is a serious problem and I have the highest expectations that Ray will represent us well and make the necessary impact that is so desperately needed.

In addition we completed the details of our joint meeting of the N.A.C.D. Public Lands, Pasture and Range with our Board at Jackson, Wyo. The prime subject for this joint session will be to complete and hopefully implement an effort by both our organizations to give Cooperative Resource Management high visibility and much wider use than just on public lands, particularly in the Western States.

Perhaps an equally important subject—water—was addressed at Casper, Wyo. where I represented the Society at a Water and Streamside Conference, in other words, riparian. What was most encouraging was the approach taken by the many excellent speakers, namely, the use of stewardship, economics, and common sense, as standards to address this latest resource concern. They had a positive attitude that will truly produce results and not a lot of conflict—a fine breath of fresh air!

Our Committees seem to be working extremely hard this year, which please me greatly. That is truly where the action is if an organization is a strong one. Also, our Annual Meeting Committees are really hard at work. It seems that the moment one enters the wrap up stage, the next is hard at it with great plans for an even larger and better meeting. It is always exciting and a true pleasure to work with these dedicated members.

I would like to report that everything looks right on line for the Summer Meeting. The Local Arrangements Chairman, Chuck Birkemeyer, certainly should be complimented for having quietly put everything in order for what looks like an outstanding meeting in one of the most beautiful areas in the Western United States. It goes without saying that now is the time to mix business with pleasure and make this meeting a vacation for the whole family with plenty to do and learn for everyone.

One wrap up note: our membership folks needs lots of help. It's everyone's responsibility to spread the word and sign up those new members.

See you in Wyoming in July and have a good summer.—**Peter V. Jackson,** Executive Vice-President, SRM.

SOUTH DAKOTA SECTION CHANGES

President SD Section: Wayne Vander Vorste, 210 N. Washington, Pierre, SD 57501

Meeting Changes: Summer Meeting - Wall, SD, June 27; Annual Meeting - LEMMON, SD Sept. 18-19, 1986

Scenes from a memorable Annual Meeting as SRM members and friends gathered in Orlando, Florida.

Condensed Minutes from the Board of Directors Meetings

The following actions were approved at the 1986 Annual Board of Directors Meeting held February 11-13, 1986, at the Hyatt Orlando in Kissimmee, Florida.

The Board approved, the reaccreditation of the **University of Arizona Range Resources Division and the Texas Tech University Range Management Program** for a period of ten years.

The **Commercial Affairs Committee is to be recognized as a SRM standing committee.** The Board also supported, in concept, a recommendation that a concurrent session for commercial members be held at the Annual Meetings so products can be introduced as to the effects on the resource. The Board authorized the Commercial Affairs Committee to pursue this matter.

A stipulation was made that **auctions to sell SRM items are not** to be held in conjunction with SRM Parent Society Annual Meeting banquets or formal evening affairs of a similar nature.

A recommendation from the Advisory Council was accepted for a **video tape produced to inform members about the structure of the Society** to be made available for viewing at Section Annual Meetings.

Approval was given for the **printing and publication of a SRM Accomplishment Report**, which would recognize the Society's committees, their members, and their activities.

The Board accepted a recommendation for enforcement of the proper **use and strict adherence to** the original printing of the SRM "TRAIL BOSS" logo.

The SRM Board of Directors went on record as supporting the concept of Coordinated Resource Management by: designating that a state representative be appointed to increase local support; having a SRM representative participate in the April National Association of Conservation Districts (NACD) Board of Directors Meeting; and, arranging a joint implementation meeting/activity with NACD representatives at the 1986 Summer Meeting in Jackson, Wyoming.

If a formal request is made and necessary funding available, SRM would be willing and able to **complete a range cover type study,** which would consist of the compilation of existing vegetation data.

The History-Archives-Library Committee made its first report to the Board as a standing committee and recommended that **no plans be made to celebrate the 40th Anniversary** of SRM, except that a special effort should be made to have as many Charter Members of the Society, as possible, attend. The Committee also reported that a SRM history manuscript has been drafted and is now in the process of review.

Two additional SRM Honor Awards will be granted at Annual Meetings as a result of a gracious contribution made by W.R. Chapline. These awards will be known as the "Chapline Research" and the "Chapline Land Managers" awards; each of them will include a $350 honorarium.

The SRM Parent **Society will sponsor a booth at the National Western Stock Show** held in Denver, Colorado, each year in January. The purpose of the booth will be to solicit new members and inform the public about range management.

The Information and Education Committee will pursue the **possibility of having volunteer positions** to improve the effectiveness of SRM public relations.

The Board encouraged the International Affairs Committee to **pursue the concept of an international newsletter** to promote range management in international communities. In addition, the International Affairs Committee will lead a study, in conjunction with the Finance Committee, to develop and establish guidelines for long-term or life-long subscriptions.

The Board **approved the long and short Position Statements on Riparian Values and the Renewable Resources Extension Act Funding Resolution.**

The Public Affairs Committee was assigned the responsibility of investigating **the concept of a SRM data base and information system on range descriptions** and conditions.

A "moratorium" **policy was established for publications which have been accepted** as being SRM sponsored. This policy allows the establishment of specific time frames and deadlines for author completion which, if not met, are cause for eliminating that publication from consideration.

February 24, 1986

Approval was given for a letter to be sent to the Secretary of Agriculture expressing concern for the relocation of the National Range Conservationist of the Soil Conservation Service from Washington, D.C. to Fort Worth, TX.

Further information regarding the Board of Directors Meeting can be obtained by writing to the SRM Headquarters, 2760 W. 5th Ave., Denver, CO 80204.

Condensed Minutes from the Advisory Council Meetings

The Advisory Council approved five items for recommendation to the Board of Directors.

1. 1991 Annual Meeting

Recommend: The 1991 annual meeting be held in Washington, D.C.

Board Action: Deferred decision to the summer 1986 meeting. President Busby asked the Advisory Council and Planning Committee to formally evaluate the method of selecting locations for the annual meeting. A recommendation from these committees will be made in summer 1986. Following action on those recommendations, a decision on location of the 1991 annual meeting site will be made by the Board.

2. Formal SRM Representatives

Recommend: That the Advisory Council encourage the Board of Directors to investigate and negotiate, as appropriate, enlisting Dick Whetsell or other appropriate choice, to act as a spokesman for the Society for Range Management concerning the profession and the resource. This person would make presentations and represent the profession at key meetings or occasions to increase awareness of rangelands. (Note: This is in addition to current staff and officers to handle an increasing workload).

Board Action: No action.

3. I & E Funding

Recommend: That the Advisory Council encourage the Board of Directors to give high priority to the I & E Commit-

tee request for funding to support a public relations firm with a short-term contract, rather than a full-time position.

Board Action: The Board accepted the recommendation. Currently there are not sufficient resources to implement the project.

4. Video on Structure of SRM

Recommend: That the Board of Directors take John Brock's video tape on the structure of SRM to Section annual meetings and be prepared to field questions from attendees.

Board Action: Accepted. Copies of the video tape are available on request from SRM.

5. Move of SCS Range Conservationist

Recommend: That the Society for Range Management write to the Secretary of Agriculture (USA) advising him that the Society for Range Management believes that the position of National Range Conservationist, Soil Conservation Service, should remain in Washington, D.C.

Board Action: Wrote letter to Secretary of Agriculture stating this position. (Note: SCS moved the position to Fort Worth, Texas)

New Officer: Dr. John Brock of the Arizona Section was elected Chairman-elect of the Advisory Council.

Other:

1. Eighteen Sections were represented by 31 members and three proxy representatives.
2. Developed 32 ideas that were presented to the Finance Committee for membership options, dues and fund raising.
3. Encouraged the National Capital Section to develop a Cowboy Songbook.
4. Noted the Board has taken action on all old recommendations. As of the 1986 annual meeting, action on only 2 of 9 recommendations has not been completed.
5. The Idaho Section conducted a workshop dealing with motivation of volunteers.

The Advisory Council expects to make a landmark recommendation on future sites of annual meetings at the 1986 meeting in Jackson, Wyoming. Be there and help us make the right choices.

The Advisory Council appreciates the help of Julie Fairchild in recording minutes of the 1986 winter meeting and typing recommendations to the Board of Directors—**William C. Krueger,** Chairman, Advisory Council

POSITION STATEMENT
RIPARIAN VALUES

Riparian zones, or areas, are the banks and adjacent areas of water bodies, water courses, seeps and springs whose water provide soil moisture sufficiently in excess of that otherwise available locally, so as to provide a more moist habitat than that of contiguous flood plains and uplands.

The key attribute of the riparian area is the occurrence of water at, or near, the ground surface. The added presence of water creates a unique environment which differs from surrounding flood plains and uplands in the combination of plants, animals, and soils. These areas are usually higher in vegetation productivity and density than associated animal species. Consequently, their value in providing a gene pool is significant. The value of forage and browse for livestock and wildlife in healthy riparian communities is frequently greater than that of associated uplands per unit of land area. Riparian areas produce significant quantities of wood products and, because of their higher moisture content, can be extremely important as fire breaks. Historically, riparian areas have been noted for their presence of high value minerals, such as gold. Of equal value to these kinds of products is the value of these ecosystems to humans for aesthetic and recreational use.

The value of water associated with riparian areas is high and, often, essentially priceless to society. Water quality and the regulation of streamflow are influenced by riparian vegetation and soils.

It is important to recognize that changes in vegetation and soil cover, and effects on the soil surface that alter the infiltration rate and increase or decrease overland flow, can change the size of the riparian area and its associated soil and plant characteristics.

Not all riparian areas are natural, as evidenced by areas adjacent to man-made lakes, reservoirs and water courses.

It is important also to recognize that there can be great differences between riparian areas. Care must, therefore, be taken to ensure that management prescriptions are not developed to apply to all riparian areas, but instead, designed after considering the particular characteristics of each area.

RENEWABLE RESOURCES EXTENSION ACT FUNDING RESOLUTION

WHEREAS, the Renewable Resources Extension Act was passed in 1978 to provide for an expanded and comprehensive Extension Program for forest and range land renewable resources; AND

WHEREAS, extension activities conducted by U.S.D.A. have contributed vastly to the improvement of productivity in agriculture, to the growth and importance of the agricultual economy, and the quality of life; AND

WHEREAS, national studies have supported the need for increased Extension Programs specifically directed to renewable natural resources of forest and range lands so that research findings in these areas can be applied to improve the management and productivity of forest and range lands, improve the habitat of wildlife and fish, improve water quality, and strengthen the economy of dependent communities; AND

WHEREAS, the Society for Range Management supports the need for extension work to improve the conservation of soil and water resources, to improve the transfer of knowledge from the scientific community to the users, and to restore the profitability of agriculture; AND

WHEREAS, agriculture contributes approximately $260 billion to the United States economy in commodities annually; AND

WHEREAS, significant noncommodity benefits are derived from forest and range lands by the American public from recreation, wildlife, fish and water; NOW

THEREFORE, BE IT RESOLVED THAT the Society for Range Management strongly support funding through the Renewable Resources Extension Act for extension services which will promote public understanding and improved production, use, and management of agricultural and other renewable natural resources of this country.

Accepted by the Society for Range Management Board of Directors in February, 1986

Trail Boss Cowboy Songbook

The National Capital Section of the Society for Range Management is pleased to announce the publication of the "Trail Boss Cowboy Songbook." The Songbook like its predecessor the "Trail Boss Cookbook" will be a part of the SRM Western Heritage Series of publications.

The Cowboy Songbook will contain contemporary and traditional cowboy songs, ballads, and poetry from the United States, Canada, and Mexico. SRM is presently soliciting manuscripts for the songbook.

Anyone interested in contributing his/her song or poem should write to Frank Khattat of the National Capital Section at the above address. There will be no limit to the number of entries submitted. Deadline for receipt of entries is August 30, 1986. Publication of the "Trail Boss Songbook" is slated for late fall, 1986.

The SRM first project, the "Trail Boss Cookbook" was published in 1984 and reprinted in 1985. Approximately 10,000 copies were sold in a few months after publication. A third printing for this book is planned for 1987.

The cookbook put out by the Range Society is priceless. I've been reading it with as much relish as any good book. I love the illustrations. I really love the book and enjoy using it in planning my menus. From reading, one gets a feeling of pride in being a rancher.—*Mrs. Doris Kirk, Finney County Kansas*

Readers Write:

Hat's Off

Dear Fellow SRM Members,

As a rancher and charter member of the Nebraska Section, Socety for Range Management, I cannot express anything but praise for the excellent February edition of *Rangelands*. It is the first publication of the Society for Range Management that I have read in my 35 years of membership that I could completely understand and comprehend (probably due in no small part to my abilities).

This issue would appeal to all rancher members and certainly if more issues had this type of articles the rancher membership would grow. The rancher member, in the past, has felt that he is wanted as a dues payer only and one of the main reasons was because of the extreme technical aspects of the *Journal of Range Management. Rangelands,* I had always assumed, was started to correct this failing but until now only a relatively few articles had appeared in it to appeal to the rancher's segment of the membership.

I urgently plead, as an interested SRM rancher member, to reestablish the format for *Rangelands* to include more ranch orientated articles and consistently strive to make the main thrust of *Rangelands* for the rancher's segment of the membership. If this occurs, I predict the ranch membership will grow by leaps and bounds and SRM will have a true partnership between the scientist and the rancher. This partnership would provide a golden opportunity for everyone—the Society, the scientist, and the producer—to grow and enhance the development of the greatest of our natural resources, the rangeland.

In conclusion, I want to repeat "hats off for a job well done," and don't quit now, you've just made me hungry.

Yours in Range Management,
Sid Salzman
Ainsworth, Nebraska 69210

Third International Rangeland Congress

The 3rd IRC is being planned for 11-16 November 1987 in New Delhi, India. The first notice and call for papers has been delayed until final approval by the Government of India (GOI). But now is the time for SRM members, and all others interested in rangeland science, to start planning for their attendance and presentations of papers at this meeting in a most interesting and fascinating part of the world. Please spread the word about the 3rd IRC.

The Indian Council for Agricultural Research (ICAR) is the key sponsor for the Congress. We are pleased by this interest of GOI in the rangeland resources, and by its actions in sponsoring an international meeting in their rapidly developing nation.

The program will feature the ecology and management of grazing lands in South Asia and similar regions of the world, and it will include the usual technical presentations of scientific advancements related to rangeland management throughout the world. Field tours will take us to representative grazing areas, to centers of agricultural research, and to some of the beautiful sites of cultural and historical interest most appreciated by tourists. India has good hotels and other facilities for visitors. The look at New Delhi and other parts of the subcontinent will make a most rewarding trip.

SRM initiated the International Rangeland Congresses and hosted the first one in Denver during August, 1978. The next IRC was delayed during unsuccessful attempts to find a venue in South America. The Australian Rangeland Society held the 2nd IRC in Adelaide during May, 1984. Both Con-

grasses were well attended with excellent programs. Each presented rangeland situations by people representing over 40 countries. These Congresses helped materially in promoting improved rangeland management throughout the world. The 3rd IRC in India will continue this tradition. 1987 will bring the meeting dates into a four-year schedule alternating with the International Grassland Congresses.

The current Continuing Committee for IRC's includes 15 members from 10 countries. The three members from the United States are Robert F. Barnes, Jay R. Bentley and Harold F. Heady. Contact any of them about questions concerning the 3rd IRC.

Jay R. Bentley, Chairman
IRC Continuing Committee
874 Indian Rock Ave.
Berkeley, Calif. 94707
(415) 524-1693

Call for Papers

International Rangeland Development Symposium
SRM Annual Meeting
Boise, Idaho
February 1987

Theme: Institutions for Rangeland Development: Strategies and Lessons Learned

Preference will be given to those papers related to developing effective institutions dealing with rangeland management in the developing world. Papers of a purely range science technical nature not linked to cultural aspects should be submitted to the appropriate technical session.

Abstracts of approximately 200 words must be received no later than **July 1, 1986,** at the following address:

Dr. James T. O'Rourke
c/o Dr. Dennis Childs
Winrock International
Rt. 3
Morrilton, Arkansas 72100
USA

Meetings of Interest

June 8-12	Western Society of Soil Science Branch Meeting, Vancouver, British Columbia.
June 15-19	66th Annual Meeting, American Society of Mammalogists, University of Wisconsin, Madison, Wisconsin (John A.W. Kirsh, Zoological Museum, University of Wisconsin, 250 N. Mills St., Madison, Wisconsin 53706).
June 15-21	International Symposium on Pest Management, University Park, Pennsylvania.
June 16-20	International Symposium on Ecology and Management of Wetlands, Charleston, South Carolina (Donal D. Hook, Dept. of Forestry, Southeastern Forest Experiment Station, 2730 Savannah Hwy., Charleston, South Carolina 29407).
June 22-26	Western Society of Crop Science Branch Meetings, Moscow, Idaho.
June 23-24	International Symposium on Windbreak Technology, Lincoln, Nebraska
June 25-27	North Central Branch Meeting, American Society of Agronomy, Lincoln, Nebraska
July 9-11	American Society of Animal Science, Western Section, Annual Meeting, Oregon State Unisity, Corvallis, Oregon (Lloyd Swanson, Department of Animal Science, Oregon State University, Corvallis, Oregon 97331).
July 20-23	Northeastern Branch Meeting, American Society of Agronomy, Newark, Delaware
July 22-27	Annual Conference of the Association for Conservation Information, Granite Ranch, Jackson, Wyoming—Contact Kay Ellerhoff, Montana Dept. Fish, Wildlife and Parks, 930 Custer Ave., West, Helena, Montana 59620 (406) 444-2474.
July 27-30	North American Alfalfa Improvement Conference, St. Paul, Minesota
July 29-Aug. 1	American Society of Animal Science Annual Meeting; Kansas State University, Manhattan, Kansas. (C. Brent Theurer, Department of Animal Science, University of Arizona, Tucson, AZ 85721).
Aug. 3-6	Soil Conservation Society of America, Annual Meeting, Winston-Salem, North Carolina.
Aug. 3-8	VI International Congress of Plant Tissue and Cell Culture, Minneapolis, Minnesota.
Aug. 10-16	The Ecological Society of America, with INTECOL Annual Meeting, Syracuse University (Alan P. Couich, ESA Program Chairman, Dept. of Zoology, University of Oklahoma, Norman, Oklahoma 73019).
Aug. 13-20	13th Congress, International Society of Soil Science, Hamburg, Germany.
Aug. 15-18	1986 Forage and Grassland Conference, Holiday Inn, Athens, Georgia
Aug. 15-22	Fourth International Lupin Conference of the International Lupin Association, Geraldton, Western Australia.
Aug. 24-29	Fourth International Symposium on Microbial Ecology, Ljubljana, Yugoslavia.
Aug. 25-29	International Symposium on Remote Sensing for Resource Development and Environmental Management, Enschede, The Netherlands (Secretariat Symposium Commission VII ISPRS, c/o ITC P.O. Box 6, 7500 AA Enschede, The Netherlands.
Sept. 7-11	International Conference on "The Management and Fertilization of Upland Soils in the Tropics and Subtropics," Nanjing, People's Republic of China.

Sept. 14-18 The 116th Annual Meeting of the American Fisheries Society, Providence, Rhode Island - Contact Carl Sullivan, Executive Director - American Fisheries Society, 5410 Grosvenor Lane, Bethesda, Maryland 20804 (301) 897-8616.

Oct. 5-8 Annual Meeting Society of American Foresters, Birmingham, Alabama - Contact Richard Zabel, Society of American Foresters, 5410 Grosvenor Lane, Bethesda, Maryland 20814.

Nov. 9-14 22nd Annual American Water Resources Association Conference, Marriott Marquis Hotel, Atlanta, Georgia - Contact Dr. Philip E. Greeson, U.S. Geological Survey, 75 Spring St., S.W., Suite 772, Atlanta, Georgia 30303 (404) 221-5174.

Nov. 30-Dec. 5 Soil Science Society of American, New Orleans, Louisiana.

Dec. 16-19 Winter Meeting of the American Society of Agricultural Engineers, Chicago, Illinois.

Hunter Honored with Teaching Award

The Range Science Education Council and Society for Range Management honored John Hunter with the 1985 Outstanding Undergraduate Teaching Award at the annual meeting in Orlando, Fla. This award, presented for the first time, honors range science educators for their time, devotion, and talent through which the success of the profession and the hope for its future is epitomized. Hunter sets a very admirable tradition for future presentations of this award.

John epitomizes the undergraduate college teacher. Above all else, he has the students' interest, performance, and well-being at heart. He motivates each student in his classes to perform at their highest level of capability. John has established a rapport not only with Range Science majors, but with many students in other departments. He offers them something that they can use in their every day life on their ranches and hunting leases. John not only teaches his classes the technical material that they should know to be productive professionals, but he also teaches them about life. One of his former students wrote "John Hunter instills in students knowledge and self-esteem. Many people can do the former; very few can do the latter."

C. Rex Cleary Honored by BLM

C. Rex Cleary, director of the Susanville District Office of the Bureau of Land Management (BLM) since 1975, was recognized for his outstanding leadership and public service by being presented the Bureau's Meritorious Service Award on March 7, 1986, in Susanville. The award is BLM's second highest award and was presented to Rex by Ed Hastey, state director of BLM.

The award pointed out how Cleary established himself as a national leader in the field of range management and the management of federal lands throughout the western United States. "Some of his work in this area paved the way for the BLM's present policy and categorizes grazing land and use monitoring as the basis for decision making," BLM officials stated. The award mentions Cleary's work with the wild horse and burro program, which was implemented by Cleary in California and Montana. The program has served as a model of professionalism and efficiency in solving the serious problems of overpopulation and over grazing caused by wild horses and burros.

Rex was active in establishing the Modoc-Washoe Experimental Stewardship Committee. The Committee increased local involvement in the BLM's decision making and dramatically improved the credibility of the experimental program throughout northeastern California and northwestern Nevada. The Experimental Committee is one of three in the Bureau established by Congress and it now serves as a national model on how to achieve the greatest amount of participation between the private sector and BLM.

C. Rex Cleary is a director of the Society for Range Management and a member of the California Section.

Agriculture Hall of Fame—Bill Anderson

It looks like Bill Anderson is making a habit of winning awards. In Yakima Bill received the 1985 Trail Boss Award. In February he received recognition for his achievements in natural resource management from Oregon State University by being placed in the Agriculture of Hall of Fame. The following is an insert for this award.

Agriculture Hall of Fame

E. William "Bill" Anderson of Lake Oswego has devoted his life to the wise use of our rangeland resources. He received his master's degree in Range Management and Animal Husbandry at Oregon State College in 1940. Following service in World War II, he returned to Oregon to work as a range management specialist for the USDA Soil Conservation Service. He worked on the county and area level until 1949 and then became the statewide range specialist for SCS until his retirement in 1974.

Retirement did not slow him down. He has served as a consultant on nearly a full-time basis since then and is a Certified Range Management Consultant. Mr. Anderson pioneered the concept of coordinated resource management and planning to help reduce resource conflicts over rangelands. This management approach integrates all ownerships, uses, and interests in the planned area into a single plan. He was responsible for the development of 23 coordinated plans in 14 counties, totalling 1.2 million acres.

He was president of the Society of Range Management in 1962 and in 1979 received its highest honor, the Frederic G. Renner Award, for his continuing contributions to rangeland management and conservation.

(from the Pacific Northest Section Newsletter)

New Head of USU Range Science Dep.

Communication from Dr. Thad Box, Dean of the College of Natural Resources, Utah State University, announces the appointment of Dr. John Malechek as the new head of the Range Science Department at Utah State University. The communication reads in part. . . "Dr. John Malechek is one of the nation's most outstanding range men. His background

includes practical experience with ranching and livestock in his native Texas, distinguished research in range animal nutrition, and leadership in grazing management. His research on the nutrition of sheep and goats has been lauded both nationally and internationally."

Named Associate Dean

In a confirmation vote by the faculty of the University of Idaho College of Forestry, Wildlife and Range Sciences held early in April, Leon F. Neuenschwander, professor of forest resources, was selected as new associate dean for research and international programs.

Neuenschwander succeeds George H. Belt, long-time faculty member and professor of forest resources.

Neuenschwander, a specialist in fire ecology and management, joined the college faculty in 1976 after receiving his Ph.D. from Texas Tech University. Through his tenure at the UI, his research in fire ecology and prescribed burning have won him and the college a national reputation in fire management.

Requiescant in Pace

John G. Clouston, who was Executive Secretary for the Society for Range Management 1957 through 1967, died in Portland, Ore., on March 5, 1986. He was a Charter and Sustaining Life Member of the Society.

His entire professional career was with the U.S. Forest Service in the Pacific Northwest region. Beginning in 1923, he worked up through the ranks to become Assistant Chief, Regional Range and Wildlife Division. He retired from this position to fill the Executive Secretary vacancy caused by the death of W.T. White. John was a range and forestry graduate of Washington State College, now W.S.U.

In 1968, the Society recognized John's 11 years service as its second Executive Secretary by awarding him a special Citation for Highest Service in recognition of his devoted service as Executive Secretary. In 1977, John received the S.R.M. *Fellow* award in recognition of his personal donation of time and effort over a long, continuous period furthering the development and effectiveness of the Society.

During his tenure as Executive Secretary, John was the source of inspirational challenges for Society officers and diligently promoted and maintained consistency and continuity between successive Boards of Directors. He provided a continual guiding influence to the Society by his clear perception of objectives and purposes, his understanding of priority needs, and his trustworthy counsel to its officers. During this period of rapid expansion and growth of the Society, he established and maintained efficient office procedures to serve the needs of Society officers and the Sections. This was achieved through personal dedication and service over and above the requirements of the part-time job of Executive Secretary as established by the Board of Directors.

His office administration and prudent management of finances allowed the Society to grow, develop a far-reaching program and, at the same time, accumulate a financial reserve that allowed bolder steps toward the Society's forward progress.

John was an active, participating member of the Pacific Northwest Section and was its President in 1955.

He will be greatly missed by his many friends, far and wide.

Harold W. Bradford died February 18, 1986. He was a charter member of the Society for Range Management and attended the annual meeting in Orlando, Florida three weeks before his death. On March 6th he was going to a meeting in Denver as a member of a newly formed advisory committee to support the Department of Range Management at Colorado State University. He was concerned with range management and conservation most of his life.

Harold was born June 16, 1913, in Alamogordo, N. Mex. After finishing high school he worked with his family operating a goat ranch in the Tularosa area. He often told stories of the hardships herding goats on the rough terrain during the drought of the 1930's.

In the fall of 1933 he accepted a football scholarship to the University of Denver. Whizzer White played for Colorado University then and Brad said at their first game White took the kick-off and ran through all eleven of the Denver players for a touch down.

After one year at the University of Denver he transferred to New Mexico State University, where he majored in Range Management. In December 1938 he married Christine Christy who was also a student at NMSU. He graduated in 1939 and started work for the U.S. Department of Agriculture in the Farmers Home Administration. In 1940 he transferred to the Soil Conservation Service. Brad and Christine had three children: Betty Jo, Patricia, and Fred. In 1949 they moved from New Mexico to Mancos where Brad was in charge of the Soil Conservation Service teams that worked with the Soil Conservation District cooperators in the Cortez, Dolores, Dove Creek, and Mancos areas.

He was an outstanding leader who dedicated himself to getting the conservation practices on the ground not just planned on paper. The grass seedings, stock ponds, irrigation systems and irrigation reservoirs in place all over this 4-Corners area show the results of that dedication.

In 1971 he retired and with Christine travelled extensively until Christine became ill. She passed away in March of 1976. After her death Brad did consulting on water right transfers working with South Park ranchers selling water rights to the eastern slope cities.

It was on this work that he met Helen Jensen, a rancher from Meeker and a member of the Colorado Water Board. They married in June of 1978 and Brad moved to Meeker to assist in the management of the Jensen ranches. They operated one of the most successful ranch-wildlife-hunting programs in the state. Helen passed away in October 1984 and Brad continued to live in Meeker and assist her heirs in handling the ranch affairs.

Procedures for Certification of Range Management Consultants

Preamble

Certification of Range Management Consultants is a nonprofit activity of the Society for Range Management (SRM). A Registry of certified consultants is maintained by the SRM.

Certification as a range management consultant is optional, and open to all members of the SRM who meet the minimum qualification.

Purpose

The general well being and quality of our rangelands depend much on the level of professional competence brought to bear on their use and management. Range Management consultants are called on to provide a variety of services associated with rangelands and their use. The Society for Range Management recognizes a need to identify adequately trained and ethical practitioners of the science of range management serving as independent, paid consultants, or serving with private or nonprofit contractors.

Certification is intended to designate qualified professionals whose standard of consultation is in the best interests of the public and our environment.

Definition

A certified range management consultant is a professional who has demonstrated expertise in the art and science of applying the principles of ecology to management of the rangeland resource; has a designated minimum level of educational training and experience; is deemed qualified by the SRM to render professional consulting services; and charges for services rendered.

Area of Specialization

The area of specialization to be certified, within the broad definition of range management, is that of "grazing and its impacts on plants and soils." The intent is to avoid certifying ecologists, botanists, agronomists, reclamation experts, land administrators, land appraisers, and individuals with other specialties closely allied to range management.

Application Procedures

Initial Application

Individuals wishing to apply for certification and entry on the Register of Certified Range Management Consultants should request an Application Form from the *Executive Vice-President, Society for Range Management, 2760 West Fifth Avenue, Denver, Colorado 80204.*

Renewal of Certification

Certification must be renewed annually. Renewal may be requested by letter, with payment of appropriate fee, to the Executive Vice-President on or before December 31 (but see the next paragraph).

Every fifth year, a Certified Range Management Consultant must submit a renewal fee with an Application Form and an update of employment and professional activities (eight copies) for review by the Panel. This five-year update of documentation must be received by the Executive Vice-President by October 1 for renewal in the next calendar year.

Failure to renew will automatically cause a lapse in certification. An individual will be reinstated following a lapse of four years or less upon payment of all lapsed renewal fees, provided that all eligibility requirements are maintained.

Re-Application

If renewal has lapsed for five years or more, re-application for certification will be required.

An individual whose certification has been denied or revoked may reapply after 12 months from the date of Panel action, provided that additional information is available for panel review.

Fees

Initial application:	$200
Annual renewal:	$ 25
Re-application:	$100

(All fees are non-refundable.)

The right to deny or revoke certification is vested in the Panel. Action to deny or revoke certification requires that the Panel transmit a statement of specific charges through the Executive Vice-President to the applicant and designate a time and place (generally at the SRM Annual Meeting) at which the individual can appear and/or be represented before the Panel. The individual must be informed that a request for appeal to the Panel must be made within 60 days after receipt of the letter of denial and the hearing of the panel must be made within 120 days after the receipt of the letter of denial.

Sustained denial or revocation by the Panel at such hearing may be appealed to the SRM Board of Directors by filing a formal request with the Executive Vice-President and the President of SRM. The President shall promptly notify the Board of Directors of the decision and an appeal hearing will be conducted within six months.

Complaints or charges of unethical conduct or incompetence against a Certified Range Management Consultant must be submitted in writing to the Executive Vice-President for transmittal to the Panel.

Rangelands
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