Rangelands

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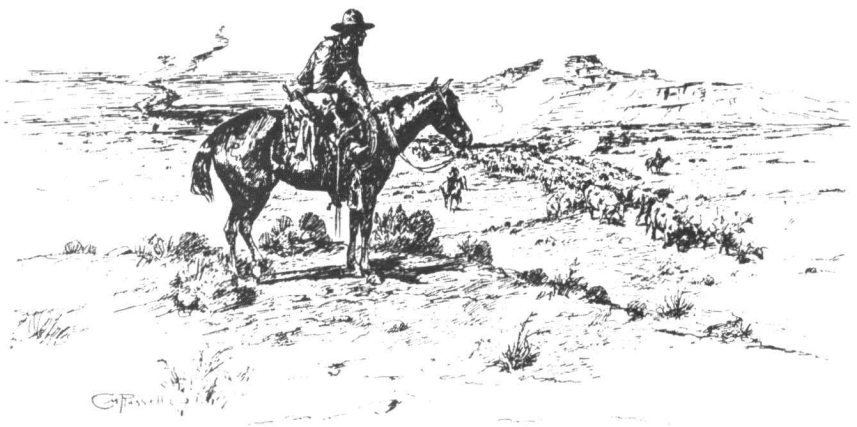

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—to develop an understanding of range ecosystems and of the principles applicable to the management of range resources;

—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.

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COVER: Prescribed burning on the Perry Henderson Ranch, Arizona. Photo by E. Schmutz. See related stories on pages 205, 207.

Buffalo!

Donald H. Dyal

Waves of heat shimmered on the prairie horizon during the summer of 1844 but only the leaders in the wagon train could see that far. Most of the wagons in the Oregon-bound train struggled with the swirling dust which enveloped each wagon with a brown pall of monotony. Even the food added to the dull sameness of the westward trek. Any change would be welcome.

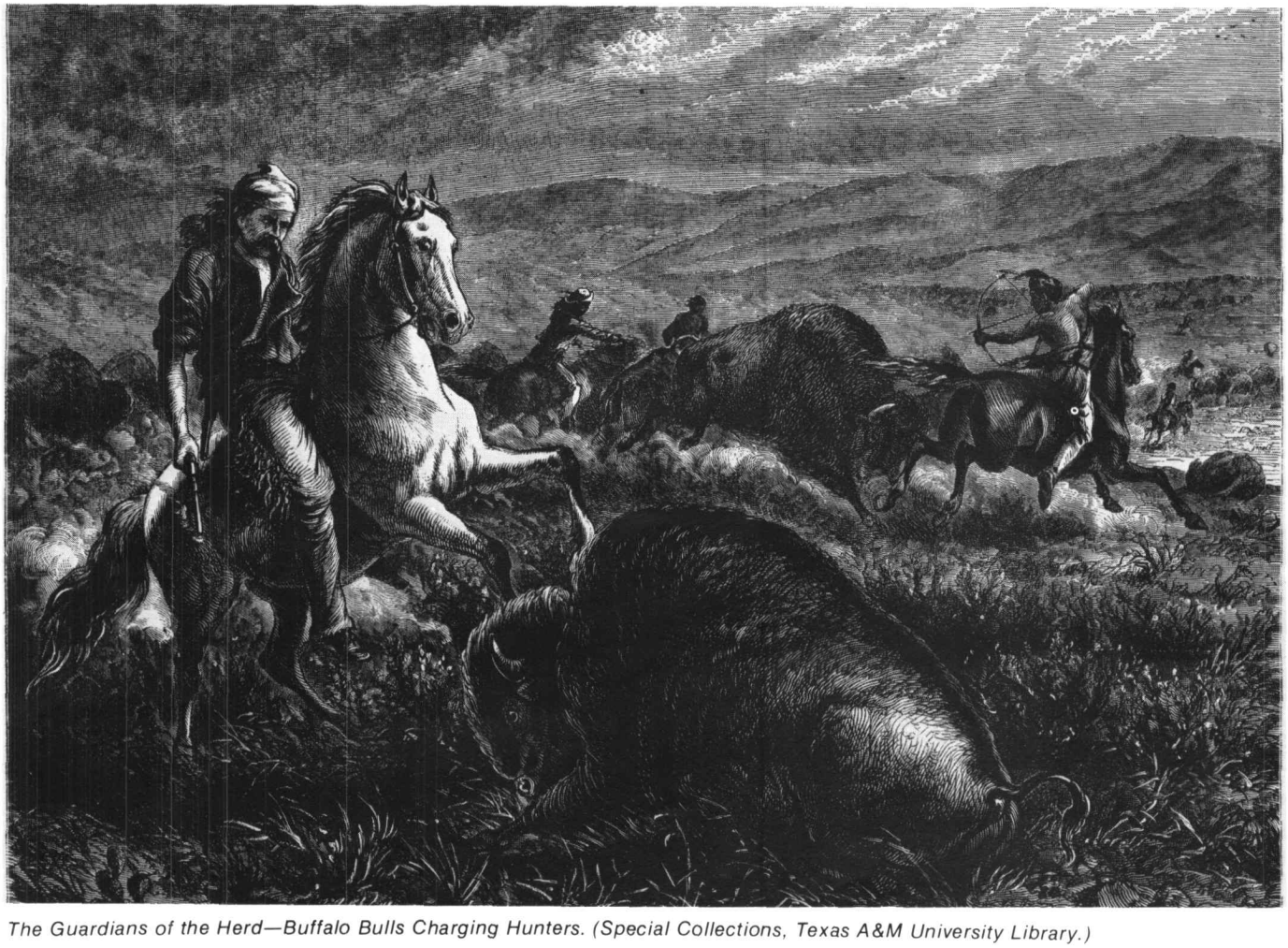
One morning the scouts spotted a large buffalo herd nearby. The wagon train erupted into a frenzy of activity. Horses were roped, harnesses untangled and tempers exploded in the anxious impatience to join in the buffalo hunt. The brightened eyes of women and children were alive with eager anticipation. Those left with the wagons could only discern the outlines of the huge herd—a brownish-black sea of hump-backed shaggy beasts plodding along through the dust.

Rifles cracked amid the torrent of dust and confusion as the first horsemen reached the herd—but no buffalos fell. A couple of scouts spurred their mounts to catch up with a great buffalo bull loping on short legs across the sod. The first scout matched the speed of his horse with the big bull, turned around and fired point blank into the buffalo's broad forehead. The bull shook his tousled head, but kept on coming. Two more riders joined the attack. Each jockeyed his horse among the herd to get a clear shot at the bull. Both rifles barked as more balls entered the beast's skull, but the buffalo continued bounding across the prairie seemingly unaffected.

Without warning, the bull halted in its tracks. Riders reined their horses and scrambled to avoid careening into each other. More rifles cracked. The bull angrily lowered its head and charged, its horns menaced the nearest rider. Another

Author is Head, Special Collections Division, Texas A&M University Library.

Editor's Note: The two illustrations were done by William Carey, who went on several buffalo hunts on a cross-country trek from 1860 to 1861. Illustrations Courtesy, Special Collections, Texas A&M University Library.



The Guardians of the Herd—Buffalo Bulls Charging Hunters. (Special Collections, Texas A&M University Library.)

rifle shot finally brought the great beast tumbling to the earth.

Over buffalo steaks that night, the riders told and retold the story of the chase and how they were almost "buffaloed" by the curious actions of the buffalo. Capable of ponderous lethargy or furious energy, the buffalo could be a very bewildering quarry. It could absorb several balls from the gun of a hunter and still continue galloping across the plains. Because the buffalo could be so frustrating, "to buffalo" entered the speech of the frontier as a term for any act which bewildered, overawed or frustrated someone.

In fact, a whole herd of buffalo phrases rumbled into the vocabulary and life of every new pioneer. One does not have to delve very far into the literature of the West before encountering numerous colorful references either to the buffalo itself or to something that reminded the pioneer of the buffalo. The constant use of "buffalo" in the language of the West speaks volumes about the impact of the hordes of buffalo upon the imagination and language of the westering pioneer.

The word *buffalo* itself entered the language of the frontier through the French and Spanish. In its original latin form, *Babalus* signified several species of wild cattle such as the Cape or African buffalo and the water buffalo of Asia. Nevertheless, travellers indiscriminately labelled all sorts of new wildlife "buffalo" and the term almost became a generic description for wild hoofed animals. Thus, historical records indicate that European explorers, travellers and trappers often described bison, elk, and moose all as "buffalo." Soon the colonists were more discriminating, however. By 1700, the big woolly hump-backed denizen of woods and plains was universally called buffalo. By the time naturalists decided that the wood buffalo *(Bison athabascae)* and the plains buffalo *(Bison bison)* were really bison, it was too late to change popular speech. Indeed, popular speech would never be the same as before the encounter with the buffalo.

Many things reminded westerners of the buffalo without actually having anything to do with the animal itself. For example, western rivers teemed with fish which had large dorsal humps. Fishermen naturally made the comparison of the hump-backed fish with the hump-backed buffalo. The bigmouth buffalo fish, the smallmouth buffalo fish, the black buffalo fish, the buffalo perch and others entered the lexicon of the American frontiersman and woman because they reminded people of the buffalo.

Another of these categorizations which were reminiscent of buffalo characteristics was the so-called buffalo cow. The buffalo cow had shorter and smaller horns than the bull. Particularly among the wood buffalo of forested regions, the buffalo cow was often minus one or both of her horns—or merely had stumps left after skirmishing with wolves and trees. Some said that the hornless head of a domestic cow resembled a buffalo cow's head. However it may have started, by mid-nineteenth century it was common to refer to hornless domestic cows as buffalo cows.

One of the more peculiar attributes of the buffalo is its need to rub and scratch its thick hide either on trees or by rolling in the prairie sod. When one buffalo discovers a good, soft spot to roll on the prairie, others join in. Hundreds of buffalo wallowing in the dirt over the years created a depression in the prairie which was aptly called a buffalo wallow. This need to rub and scratch also had its effect on the vegetation of the prairie. Dozens and even hundreds of buffalo could rub the bark off a tree in fairly short order. Often, those trees which survived were grotesquely twisted and gnarled, the scars from generations of buffalo. The lone and twisted tree on the prairie earned the sobriquet—buffalo rubbing post.

One can imagine the difficulty the telegraph company had with the buffalo. Hundreds of telegraph poles planted across the plains became ideal rubbing posts. Line maintenance crews were hard pressed to keep the lines open as an army of buffalo queued up to rub the poles right out of the ground. Telegraph lines were regularly down because of the depradations of itching buffalo. One bright engineer suggested that metal spikes be placed on the poles to discourage rubbing. Rather than solving the problem, the metal spikes apparently stimulated the tough hides of the buffalo. Company employees observed dozens of buffalo contentedly rubbing themselves on the spiked poles while leaving the plain poles unmolested. The telegraph company got no respite until the buffalo had been exterminated.

Some of the most famous buffalo phrases derived from military experience in the West. Indians named the black troopers sent west after the Civil War buffalo soldiers because of the similarity between the buffalo's mane and the curly-haired Negro. The cavalry adopted other buffalo phrases. Westerners noticed that the buffalo herd was usually protected on its flanks by large bulls. Many units during the Civil War utilized horse soldiers to "ride buffalo" for the unit. Like the buffalo bull which protected the herd, the troopers who were ordered to "ride buffalo" protected the flanks of the advancing cavalry.

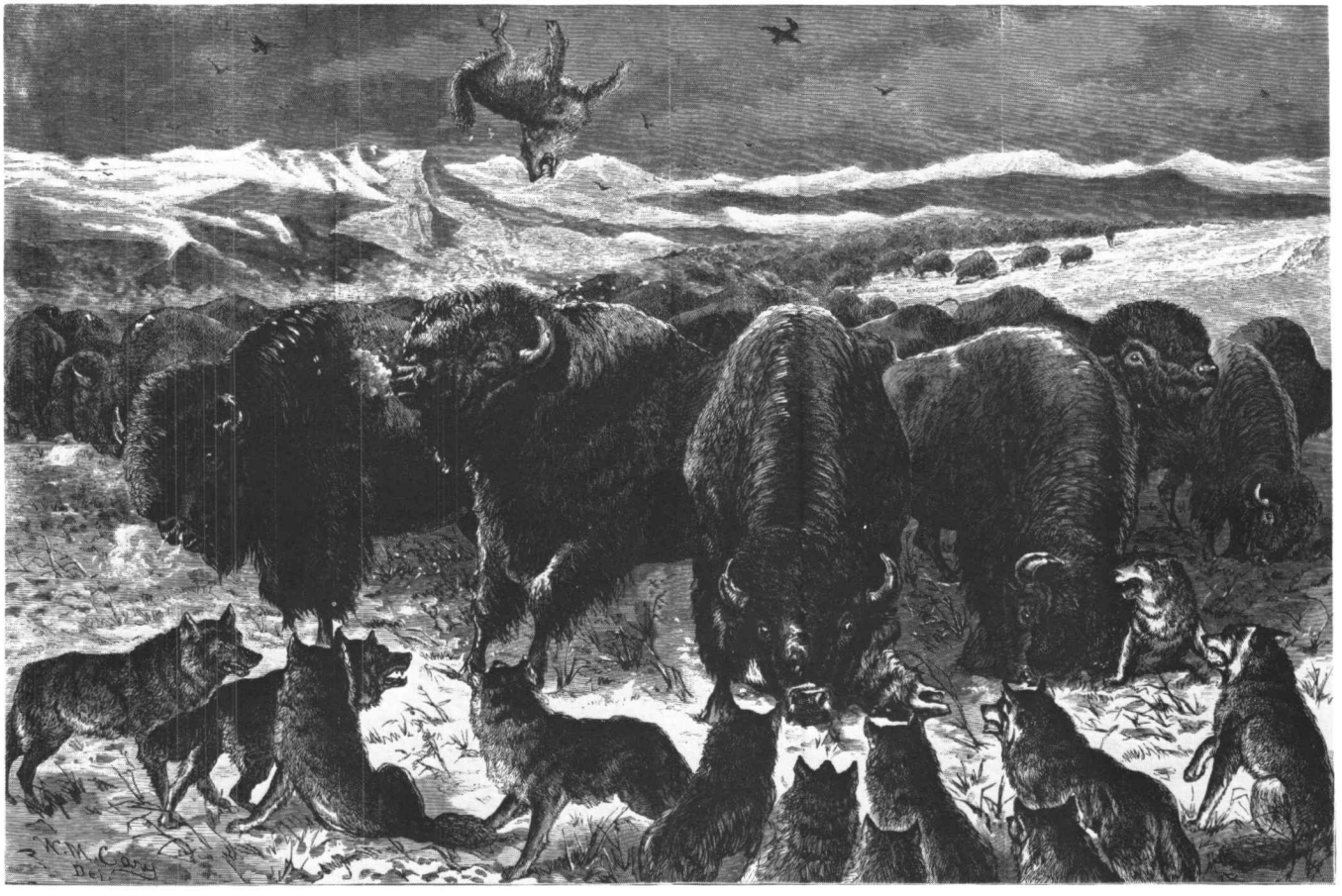
Human conditions were also described in terms of the buffalo. Cushing's disease produces fat pads on the back of the human neck. This symptom of the disease became known in the literature as buffalo hump because of its obvious resemblance to the hump-backed buffalo.

Another interesting human condition which stemmed from the buffalo was buffalo mange. The unfortunate possessors of buffalo mange were almost invariably buffalo hunters. Buffalo hunters had the dubious distinction of being able to go without a bath longer with stronger results than just about anyone. This condition of the buffalo hunter led to a very fertile field for the propagation of lice, which was the chief ingredient of buffalo mange. It was said that you could smell a buffalo hunter long before you saw him—especially if the wind was right. This early warning device undoubtedly aided more fastidious westerners in escaping the contraction of the mange.

Buffaloisms also found their way into politics. During the Civil War, the South had its equivalent to the northern copperheads. Particularly along the southeastern seaboard, a buffalo was an individual who was disloyal to the Confederate cause. Unfortunately, the derivation of the original comparison to the animal buffalo seems to have been lost to posterity.

Many buffaloisms came into being through an association with buffalo—either geographically or some other more intimate relationship. Buffalo bugs, buffalo moths, the dreaded buffalo gnat, and buffalo beetles were all insects found in quantity in buffalo country.

Other buffalo-related terms included the buffalo bean, buffalo pea, or buffalo plum which are all plants of the genus *Astralagus* or near relatives which inhabit buffalo country. The bright red buffalo berry and the buffalo bush are of the *Shepherdia* genus—spiny shrubs, the first of which served as natural food for man and beast alike. Buffalo burs *(Solanum*



Holding the Wolves at Bay: Buffalo Bulls Protecting the Herd. (Special Collections, Texas A&M University Library.)

rostratum) irritated their way into the clothing of early westerners—not to mention their original annoyance of tangling in the coat of the buffalo. The buffalo flower or buffalo clover, is what is more commonly known today as the Texas bluebonnet *(Lupinus texensis).* In some locales, buffalo clover can be one of the Trifoliums. Whether buffalo clover was *Trifolium stoloniferum, T. reflexum, T. pennsylvanicum* or the lovely *Lupinus texensis* was completely immaterial to the westerners; what mattered was the buffalo clover lived with the buffalo. The golden or buffalo currant and the buffalo gourd *(Ribes odoratum* and *Cucurbita foetidissima)* grew in the southwest buffalo country. These plants were strongly identified geographically with the buffalo as were the buffalo tree, buffalo nut and myriads of other "buffalo" plants. Probably the most significant buffalo vegetation was the luxuriant buffalo grass (*Buchloe dactyloides,* Grama St. Augustine, etc.). These lush grasses flourished all over the West and allowed not only the support of numberless buffalo, but thousands of trailing cattle as well.

The last grouping of buffalo phrases includes those which come from part of the buffalo itself. Buffalo wood was another name for dried buffalo dung. Also called buffalo chips, they fueled innumerable prairie campfires generations ago. James G. Bell, a cowboy on the Texas-California cattle trail in the early 1850's, suggested a novel use for buffalo chips. Bell had been on the trail for some time and had become accustomed to sights, sounds and smells which were not as prevalent elsewhere. One night, while writing in his diary next to a buffalo chip fire, Bell wrote that he thought that burning buffalo chips smelled like hickory wood and that buffalo chips would be excellent for smoking meat. While almost everyone is familiar with the savor of "hickory smoked ham," it seems at least questionable that "buffalo dung smoked ham" would whet very many appetites. Bell's musings on buffalo chips apparently never went beyond thoughtful reflection—he does not mention ever putting his theory to the test.

The imaginativeness of westerners in naming buffalo products is notable. Buffalo wood is very descriptive, but what about buffalo cider? Occasionally also called buffalo gall, which is closer in description, buffalo cider was the rather ridiculous name given to the foul-tasting liquid found inside a buffalo stomach. When far from water, buffalo hunters used buffalo cider to quench their thirst—although one might imagine that it was drunk through clenched teeth.

The buffalo coat, buffalo robe or buffalo wrapper are easy to identify as coverings made from the hides of buffalo. A buffalo tug was a leather thong used by hunters as a rope substitute. Buffalo tea was the water left in a wallo after the buffalo finished wallowing.

The impact of the once mighty sea of wooly buffalo on the Indian and westward-moving pioneer probably can never be assessed, but buffalo cow, buffalo pea, buffalo robe, buffalo street, buffalo wallow, buffalo rubbing post and dozens of other buffaloisms bear quiet testimony of the force with which the buffalo bellowed its way into the experience and life of the pioneer and stimulated the westerner's imagination. The constant use and re-use of buffalo as a descriptor, verb and noun in the diaries, journals and histories of pioneers highlights the telling impact of the buffalo on frontier life. ●

"Duck Stamp" Dollars Reserve Native Prairie Tracts

Kenneth F. Higgins

The glaciated prairie pothole region is a primary production area for ducks in the Northern Great Plains. In the continental United States, the region lies between the western edge of the deciduous forest, the Canadian border, and east and north of the Missouri River starting near Sioux City, Iowa. Presently the prairie pothole region is a diversified composite of croplands interspersed with islands of native rangelands. The only two physiographic regions still containing significant amounts of native prairie rangeland within this region are the Prairie Coteau of southwestern Minnesota and northeastern South Dakota and the Missouri Coteau of central South Dakota and central and northwestern North Dakota.

Formerly the prairie pothole region was a continuous prairie ecosystem interrupted by many natural wetlands (potholes) and with occasional motts of trees and shrubs or wooded draws and water drainages. The prairies were always home for many species of wildlife, but the demands of people have made a change in the prairies and the wildlife.

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Buffalo are no longer the most obvious wildlife in the area. They were mostly gone even before the plows of the settlers disturbed the prairie soils and flora. Ducks and other waterfowl are now among the most abundant groups of wildlife remaining in this region and especially in the prairie pothole ecosystem.

In the early 1960's a program known as the "Small Wetlands Program" was initiated to reserve a number of wetland-upland complexes specifically for the future perpetuation of ducks. This program was funded by the sale of "duck stamps", also known as Migratory Bird Hunting and Conservation Stamps. The primary purchase and easement targets for these "duck stamp" dollars were wetlands with some adjoining uplands for bird nesting and other wildlife benefits. During the period 1960-1978, approximately 169,830 acres of wetlands and 265,740 acres of uplands were purchased on 2,352 wetland-upland complexes known as Waterfowl Production Areas with "duck stamp" dollars. Of the upland acres 93,492 were included in native prairie tracts and they were located on 1,746 different areas. A native prairie tract on a Waterfowl Production Area in this paper

A view of one of the 1,746 prairie-wetland tracts that was purchased with "duck stamp" dollars during 1960-1978. Public use of these tracts is encouraged.

included the sum of all units of original sod prairie and all units of go-back prairie that had not had a tillage history for approximately 25 years or longer. The range condition of a prairie was not used as a selective factor in the inventory as long as some native plant species were present in the floral composition.

These native prairie tracts range in size from 1 to 1,416 acres. As of December 1978 their distribution and acreages in the glaciated prairie pothole region were as follows: Nebraska: 1 tract and 38 acres; Montana: 39 tracts and 2,598 acres; Minnesota: 390 tracts and 14,788 acres; North Dakota: 884 tracts and 58,852 acres; and South Dakota: 432 tracts and 17,216 acres. These data were obtained from refuge Resource Inventory and Planning cards.

One main purpose of these native prairie tracts is to provide food, nesting areas, and cover for ducks and other wildlife; however, they also provide additional benefits to the general public. For example, hundreds of acres of native prairie were released from wildlife production purposes in the summers of 1976 and 1980 and were made available to farmers and ranchers as livestock forage and hay to help ameliorate the effects of extreme drought and low herbage production in this region. Many of the native prairie tracts are also used annually for demonstration and education purposes by high school and college biology, ecology, and range management classes.

The amount and kinds of wildlife occurring on any one tract of native prairie depend a lot on the kind of vegetation present and its use. Compared to most other prairies, the management of the vegetation on these 1,746 prairie tracts is unique. The vegetation is managed primarily for better duck production. Vegetation management practices include burning, idling (no use), mowing, haying, and grazing. The latter two practices are accomplished through cooperative agreements with neighboring farmers and ranchers. All management practices are usually designed to induce changes in vegetation structure, which will produce changes in plant communities and wildlife populations. Manipulating cover to benefit wildlife is an old art. Procedures for better prairie and wetland management systems are continually being researched and developed to benefit and maintain these prairie wetland complexes as natural as possible and to improve their potential for wildlife habitat. Many of the guidelines from these studies will also be useful in preparing management strategies for better wildlife and red meat production on private and public rangelands.

Most native rangeland remaining in the glaciated prairie pothole region is in the stewardship of the private landholder. The future fate of many private holdings is very tenuous under the present system of economics. Grain farming with push-button and hydraulic technology and 6 months of effort is very attractive to a large percentage of the rural population when such farming is compared to the year-round requirement of animal husbandry. We should all be proud of the remaining prairie remnants. They are special, just as are the national parks, national grasslands, and national forests.

The prairie-wetland complexes alluded to in this paper help support the traditional flights of waterfowl each spring and fall. Management and regulation of these specific prairie-wetland complexes are a responsibility and function of the National Wildlife Refuge System of the U.S. Department of the Interior. These prairie-wetland complexes are open to the general public with the exception of some restriction of the kinds and times (season) of use. Bird enthusiasts, photographers, trappers, fishermen, and others use these complexes as base areas for their hobby endeavors. However, the greatest public use of these prairie-wetland complexes is by duck hunters, and rightfully so, because this group purchases the largest share of "duck stamps" sold each year.

Specific information about the location, size, use, flora, and fauna of these prairie-wetland complexes can be obtained at National Wildlife Refuge headquarters or Wetland Management District Offices at the following locations: Medicine Lake, Montana; Kearney, Nebraska; Detroit Lakes, Fergus Falls, Benson, and Litchfield, Minnesota; Crosby, Coleharbor, Kenmare, Upham, Devils Lake, Kulm, Pingree, Valley City, Moffit, and Cayuga, North Dakota; and Waubay, Columbia, Madison, and Lake Andes, South Dakota.

Ducks and wetlands are inseparable in the prairies. Hunters know this, bird watchers know this, wildlife managers know this, and most importantly people who manage the croplands and rangelands know this. The 1,746 tracts of native prairie within these upland-wetland complexes known as Waterfowl Production Areas are not the only lands purchased with "duck stamp" dollars. Considerable acreages have also been purchased in central and southern parts of the United States to provide staging, resting, and wintering areas for waterfowl. Since 1934, when "duck stamps" were first sold, nearly 2.5 million acres of waterfowl habitats have been acquired or taken under easement within the United States with revenue from these sales. By purchasing "duck stamps", more than 2.2 million people provide over $16.5 million in annual revenue. It is certainly gratifying to know that some of the remaining native prairie remnants in the Northern Great Plains are being reserved for the future with "duck stamp" dollars. ●

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Report on Fieldtrip to Riparian Zones in Sawtooth National Recreation Area and Vicinity, Idaho

J. Peek and J. Gebhardt

Condition of riparian zones is an issue whose time has finally arrived. Not that these critical areas haven't been recognized as important for their watershed, fisheries, and wildlife values before now, rather, finally sufficient concern prevails to force a review of their management. On the western rangelands, the issue is primarily the effect of grazing domestic livestock on these areas. Cattle are known to concentrate on areas near water and may damage streambanks and woody vegetation.

The issue was given more visibility as a result of a remark by Dr. Thomas Nelson of the U.S. Forest Service at the 1979 convention of the Society of American Foresters. The comment that conflicts between wildlife and livestock are generally local problems and the degree of conflict is low caused responses from the American Fisheries Society and The Wildlife Society to the effect that this is misleading and that the status of riparian habitat is indeed a serious issue across the West. Subsequently, R. Max Peterson, Chief of the U.S. Forest Service, proposed a fieldtrip to the Sawtooth National Recreation Area, with representatives of the Wildlife Society, (TWS) American Fisheries Society, (AFS) and other concerned parties.

The Sawtooth National Recreation Area (SNRA) was established by Public Law 92-400, on August 22, 1972. Located in central Idaho approximately 50 miles northeast of Boise, this 754,000 acre area contains some of the most important anadromous fish (steelhead trout, sockeye and chinook salmon) spawning grounds in Idaho. Headwaters of the Middle Fork, East Fork, and the main Salmon River occur within this area and produce approximately 28% of the wild salmon in Idaho. A primary objective of the SNRA is protection and conservation of the salmon and other fisheries (U.S. Forest Service 1975, General Management Plan, SNRA).

The following comments are based on experiences gained during the trip, 7-8 October 1980, to the SNRA.

1. Forest Service is relying entirely on restoring or maintaining riparian habitat by manipulation of grazing through rest-rotation or various deferred systems. These systems are designed to grow grass, not woody vegetation. They may help to restore herbaceous streambank vegetation and they may or may not reduce streambank sloughing.If woody vegetationis present, it may be retained by these systems. However, if woody vegetation is not present, or is in poor condition, these grazing systems should not be expected to restore woody plants without additional actions.
2. There is action in preventing smolt[1] loss to irrigation systems. However, there is no action of consequence in restoring rearing habitat except by manipulating grazing, and this is inadequate. Small feeder streams which provide rearing habitat are especially vulnerable to damage.
3. There is experience in Oregon in restoring woody vegetation in riparian zones which should be assessed for its

A small stream in the Stanley Basin, Sawtooth National Recreation Area, which has overhanging banks and sufficient riparian vegetation to keep water temperatures low and retain its suitability as rearing habitat for salmon and steelhead. Photo by T. Bjornn, Idaho Cooperative Fisheries Unit, Univ. Idaho, Moscow.

A stream which has insufficient riparian cover and has been widened extensively through improper grazing. Water temperatures are too high and cover too low for suitable habitat for salmon and steelhead. Photo by T.C. Bjornn, Idaho Cooperative Fisheries Unit, Univ. Idaho, Moscow.

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[1]Young salmon or steelhead that is about 2 years old and is assuming the adult's silvery color and is on its first descent from the river to the sea.

value in Idaho areas. Plantings of willow and other native species coupled with temporary fencing should be tried.

4. There was no mention of any planning effort, directed at determining a priority for actions on a stream by stream basis. An assessment of condition of critical spawning areas should be made if it hasn't. A priority to schedule work on a stream by stream basis should be established, based on inventory and current knowledge of people in the area. The priority, if anadromous fish are indeed a high priority on the SNRA, should not be established on a basis of grazing interests but rather fisheries considerations. Areas we visited were receiving attention primarily through the research effort of the Intermountain Station rather than by initiative from the National Forest. Cooperation between all agencies involved is of course to be expected.
5. Range conservationists currently have the primary lead in managing riparian vegetation. They should not be expected to evaluate and appraise riparian and stream habitat without the aid of a fisheries biologist. Range conservationists are expert in managing rangelands and are responsible for devising grazing systems. They are not expert in managing limnological[2] problems, except indirectly. There is a need for greater awareness that when fisheries values are involved, a fisheries biologist needs to be consulted very early in the planning process or when changes in management are contemplated. Grazing systems should not be modified merely to accommodate the rancher unless the other resources have been given adequate consideration.
6. The research is directed entirely at meadow systems. There are important anadromous fish spawning and rearing areas which are not associated with meadow systems. These other streams should also be evaluated for their unique responses to grazing pressure.
7. We were reminded that the higher elevation drainages were "forgiving." This implies that there has been some transgression that needs to be forgiven. It was probably meant to signify that the vegetation base recovers, but the effects on fisheries or wildlife are unknown. Natural deterioration of spawning and rearing habitat through drought may well be aggravated if grazing is not properly managed. The concern appears to center on accommodating the grazing operations while the other resources are not adequately considered. Plans for managing livestock during drought years should be developed which consider the potential impacts on other resources involved, especially the critical riparian zones.
8. The AFS and TWS interest in these resources should not be fickle. Resource management agencies are notorious for responding to the current controversy at the expense of less controversial but often more important issues. If TWS and AFS deem it sufficiently important to urge more action now, they should earmark October 1985 for a follow-up to see what actions have been taken.
9. AFS and TWS should urge more funding for woody plant restoration and streambank restoration. However, some redirection of effort and emphasis is also feasible. For instance, there is concern that establishing fish screens on streams with no rearing habitat is of little value. If so, then when a fish screen is established, the stream itself should be assessed for rearing habitat quality. Fish screens are expensive, and monies allocated for them could be more profitably used to systematically restore a stream at a time, complete with rearing cover. Also, the management agency very often neglects to evaluate results of activities leaving this to "research." Evaluation of the effects of a management activity is an integral part of the management program.
10. Finally, it is well to remember that the rancher with long-term experience in this area has watched livestock numbers decline along with the anadromous fishery. He has witnessed higher deer populations at a time when there were many more cattle and sheep on the range than now. Direct correlation between grazing pressure and numbers of salmon or deer is obviously useless. This means that we should address the need of the rancher concurrently with fish and wildlife habitat needs. We need to distinguish between historical actions which affect current condition and the current grazing program and its effects. The real challenge is to devise means by which woody vegetation can be maintained and stream condition can be improved in the presence of livestock grazing. We should recognize that the good will and cooperation of the ranching community is important to the long-term conservation of these resources. ●

[2]Adjective for limnology meaning freshwater.

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Wildlife Use of Stockwatering Facilities

Linda M. Candelaria and M. Karl Wood

Adequate water has always been and probably will continue to be a problem on grazing lands, especially in the western US. Since the earliest days of cattle grazing, ranchers have constructed various stock-watering facilities to supply the water needs of their livestock. These facilities not only should provide adequate water for livestock but also should be properly placed relative to the available forage. An adequate number of properly distributed facilities encourages uniform grazing, aids in pastures improvement practices, and retards erosion.

Through the years, wildlife has become an increasingly important range resource. While the use of existing stockwaters by wildlife has been noted by many, few of those facilities were developed for the use of both livestock and wildlife. Stock-watering facilities, by various, slight modifications, may be adapted to benefit wildlife.

Types of Stock-watering Facilities

Stock-water supplies may be natural or constructed, permanent or temporary, and may use surface water or ground water. Primary stock-watering facilities are stock ponds, stock tanks, and dugouts. However, natural potholes may also be used by livestock.

Stock ponds are formed by building dams across natural waters (Bue et al. 1964). Located mainly in semiarid plains, stock ponds are common in the western US and Canada. These watering facilites are characterized by gently sloping shorelines except at the dam, with water levels responding to climatic factors just as natural areas do. Stock ponds support emergent and submergent vegetation, with grasses being common away from the shoreline. Many stock ponds are similar to those in eastern Montana, which have an average depth of 6.9 feet with an average surface area of 3.2 acres, and are slightly alkaline (pH 7.7–9.4).

Stock tanks are troughs or metal facilities fed by piped water from natural springs or stock ponds. Water may also be pumped from wells and piped into tanks.

Dugouts are large holes excavated to catch runoff water or to intercept groundwater. They are frequently built at the edge of a slough, pothole, or playa to collect overflow from the wet area, and they will intercept groundwater where the water table is high. Dugouts are mostly used in the prairie pothole region of the northern US and southern Canada. Dugouts have been gaining popularity since 1950 with farmers and ranchers in eastern South Dakota, and in many Soil Conservation districts, they are the only kind of stock-watering facility that has been developed. Dugouts may be constructed in intermittent waterways, on level grounds, or in temporary or semipermanent wetlands, but they are usually constructed on level ground away from wetlands. Dugouts are simple to construct and are the only type of earthen reservoirs that can be economically constructed in flat terrain. Dugouts have steep sides with one or both ends sloping gently. In South Dakota, the average size of a dugout is 60 × 160 feet with a depth of about 12 feet.

Natural potholes, depressions of glacial origin, are found on the prairies of the northern US, southern Canada, and in some intermountain glaciated valleys. Most pothole areas are on public lands used for grazing, where they provide an important source of water for livestock and wildlife.

Effects of Livestock at Watering Facilities

Inadequate investigation and planning lead to stock-water facilities that are detrimental to proper land use. An insufficient number of unappropriately placed stock-water developments results in poorly distributed grazing patterns; overgrazing occurs near the water while distant areas are underused. In 1956, an increase in stock-water developments on the Starkey Experimental Forest and Range in Oregon resulted in decreased concentrations of cattle on overgrazed areas and increased use of areas that previously received little or no use. A decrease in trailing also resulted due to increased time that livestock spent grazing.

Livestock tend to trample shoreline vegetation, muddy the water, and contaminate it with droppings. Muddy shorelines result in greater water turbidity, which decreases the amount

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Copies of the extensive literature citations used by the authors to develop this review can be obtained upon request.

A stock pond that offers limited uses by wildlife but has high potential for development.

of aquatic plants and animal foods. In South Dakota, shoreline cover was influenced by grazing intensity: when grazing intensity was less than 15 cattle-days/acre-year, grass type shorelines resulted, but when grazing intensity was equal to or greater than 30 cattle-days/acre-year, mud shorelines resulted.

Overgrazing tends to eliminate habitat diversity and create a homogenous vegetative community, which results in decreased avifaunal variety. Livestock grazing may also convert native vegetation to plant species that are less palatable to the livestock themselves. In addition, livestock overuse destroys ground cover and bird nesting habitat. Livestock may also damage trees by their rubbing, browsing and trampling.

Wildlife Use of Watering Facilities

Although it is general knowledge that many kinds of wildlife make use of stock-watering facilities, very few studies have been conducted on this subject. Waterfowl are the only wildlife species that have been studied to any extent in relation to their use of stock-watering facilities. Other wildlife are sometimes mentioned in discussions of stock-watering developments, but few studies have been conducted which observed wildlife use of stock-water in different areas. Of note is the absence of information on federally owned grazing lands, where stock-water developments should benefit both the livestock and the wildlife.

Large Mammals

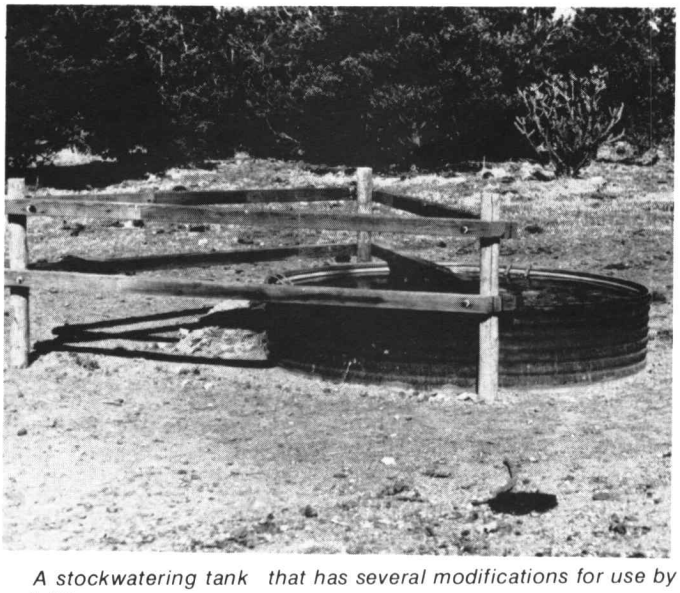
Catchment basins used by livestock are frequently used by big game in Tucson Mountain Park, Arizona; mule deer and javelina used concrete reservoirs, especially in the spring-summer dry period, and probably use stock-water wherever it is available. Deer and javelina used basins in an area near Tucson, Arizona, that was mostly closed to livestock. Bighorn sheep may use stock-water if livestock competition is not excessive. Natural pothole areas in the northern US prairies are used by summer resident pronghorn antelope, by migrating deer, and as calving grounds by elk.

Small Mammals

No studies were found on the use of stock water by small mammals. However, water facility modifications such as escape ramps, constructed to benefit small birds, were noted to be generally also beneficial to small mammals.

Birds Other Than Waterfowl

Water developments which increase the amount of available water are both beneficial and detrimental to non-game birds. Benefits include the increase in available water; the increase in insects attracted by the water, livestock, and manure; and the creation of new habitats such as dusting areas, mudflats, and marshes. Detriments include inunda-



A stockwatering tank that has several modifications for use by wildlife.

tion of the original habitat, attraction of predatory mammals and snakes to the water, and worst of all, livestock overuse and resulting deterioration of the area in the vicinity of the water. Additionally, troughs may be death traps for birds if escape ramps are not provided. Factors other than those mentioned may at times be detrimental to birds. For example, a rancher in Nebraska found 36 dead killdeer around the runoff from a stock tank. Fearing for the safety of his cattle, the rancher had the water analyzed. Although inconclusive, the lab analysis indicated toxic poisoning, which prompted a change in the watering system.

Upland game birds are known to use stock ponds for watering. In Tucson Mountain Park, Arizona, white-winged dove, mourning dove, and Gambel's quail used concrete reservoirs during the spring-summer dry period. However, Gambel's quail were seldom seen around reservoirs when succulents were available. Movements of Gambel's quail in southwestern Utah were affected by stock-water. During the water-critical period (June-September) they made frequent, and sometimes daily trips to water. Although some stock tanks went dry, most tanks maintained quail during the hot summer months. Potholes provide excellent habitat for marsh birds and breeding grounds for shore birds.

Waterfowl

Waterfowl use of stock-water facilities, especially ponds and dugouts, has been extensively studied. Breeding waterfowl require emergent and aquatic vegetation for nesting cover, escape cover, and food, which well-managed water facilities provide. It has been noted that natural potholes in Idaho provide excellent habitat for waterfowl.

Stock ponds in the northern Great Plains are used for resting by migratory waterfowl, and for breeding purposes (mostly by dabbling ducks). Over the years stock ponds in this area outproduce natural areas, because their large size and more efficient drainage retain water when natural areas go dry. In wetter years, however, marshes are better in quality than stock ponds.

The type of land use around the ponds most determines their use by waterfowl. In South Dakota, grassy shorelines, which resulted from light grazing, supported 2-3 times as many breeding pairs and were used by broods 3-4 times as much as mud shorelines, which resulted from heavy grazing. Stock ponds with no grazing however, yielded shorelines with tall emergent plants that were not suitable for dabbling ducks but may have been suitable for diving ducks. A study of waterfowl production in stock-watering ponds in relation to rest-rotation grazing in Montana showed that complete rest, or grazing only during spring and early summer, resulted in an increase in the number of duck broods the following spring, while grazing during the summer and fall resulted in a decrease of broods the following spring. Differences were attributed to regrowth of vegetation in the areas adjacent to the stock-watering facility during the summer, which left residual cover for nesting the following spring. The use of dugouts in South Dakota by waterfowl was positively correlated with vegetation height. Waterfowl use of dugouts increased as water levels increased to near ground level.

Fish and Amphibians

Stock ponds may also be used to produce fish and bullfrogs (Hamilton and Jepson 1940). Fresh-water fishes may be divided into cold-water and warm-water forms. Because trout, the most common cold-water fish, require water between 33 and 75° Fahrenheit with optimum temperatures being from 50 to 65° Fahrenheit, they are seldom found in stock-watering facilities. However, warm-water fish species, such as sunfish, perch, pike, catfish, and minnow families, are commonly found in stock ponds.

Management Suggestions to Adapt Water Facilities for Wildlife

Modifications of watering facilities and management practices may be adopted to increase wildlife use. To provide the optimum benefits for wildlife, stock-water reservoirs should be protected against pollution and trampling by livestock, silting, wave action, erosion, and burrowing animals. Deferred, seasonal, or rotation grazing system should be used whenever possible, especially to increase residual vegetation. In the northern Great Plains, grazing should be delayed on areas with residual cover until incubation is finished on most nests. Additional water holes might be provided to aid in dispersal of livestock into unused areas.

Fencing provides the protection needed to develop and maintain shoreline vegetation, provides good drinking water, and establishes an environment that is beneficial to wildlife. Critical parts of the reservoir should be fenced to avoid damage by livestock, and complete fencing should be done when the range needs rest (SCS 1971). If complete fencing is required, water may be piped from the pond to a trough or tank outside the fence for use by livestock.

Riprapping the fill or planting a good vegetation cover helps prevent silting, erosion, and wave action. Additionally, special plants can be seeded which attract wildlife. Periodic maintenance checks should be made on water facilities. Burrowing animals may be stopped by using repellents or physical barriers.

Escape ramps could be constructed to prevent drowning of small birds and mammals. Log rafts or boards, anchored in the center of the pond, could be placed in the water to furnish loafing sites to increase use by breeding waterfowl. Dugouts should be built in or near natural wetland areas, where water will be at a high level in good years, and remain in some quantity during dry years. Stock ponds rather than dugouts should be constructed whenever possible, and some water areas should be developed for wildlife in areas where grazing is not allowed.

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High Altitude Photography and Range Trend

Lee E. Hughes

With the availability of U-2 and landsat aerial photography, the agencies concerned with shifting range trend on public lands have a tool that can bring efficiency to the trend process in line with the space age.

Space age technology often smacks of high technology and the orthodox quickly fade from the technology. There is no need to fade away as all the "Star Wars" style of trend documentation involves is observation of tone changes on aerial photographs.

The Concept

The concept to put in practice is that at key location of rangelands a darkening of tones on aerial photographs taken at 5-year interval of each other would mean an improving range condition. A lightening of tones would indicate a decline in range condition. Range condition is determined by the species composition, and the amount of ground cover: the greater the amount of desirable species and ground cover the better the condition. Desirable species are all the perennial grasses, forbs, and browse desirable to livestock and wildlife.

The concept is drawn from a study on the Arizona Strip, where 13 different sites were observed for tone changes on aerial photographs and field range condition were checked on the ground. Seven of the sites had trend data, some of which went back to 1950. Six of those sites with trend data are exclosures. Trend and condition were determined through plots and transects.

The aerial photos studied were black and white (1:20,000) of 1966 and 1974; color infrared (1:15,000) of 1976, and color infrared, (1:120,000) of 1978. Visual comparison was used to study tones at the sites on the air photos.

The Result

The study demonstrated that where dark tones and darkening tones occurred on two aerial photographs taken at the 10-year interval (1966 and 1976), or 2-year interval (1976-1978), the better condition was with the darker tones and the poorer conditions were with the lighter tones.

Such things—film development, chemistry, film type, wet or dry weather—did not influence the condition and trend detection. If species composition and good perennial plant cover existed, the darker tones resulted and lighter tones resulted from poor perennial plant cover.

As with most studies, an exception showed up. Our exception was when brush reinvasions are occurring on land treatment areas or where brush and trees are invading into their climax areas, darker and darkening tones showed up on the aerial photographs. The brush reinvasion demonstrated a decline in trend with darkening tones.

Practical Use

There are two potential uses of air photos in trend. Both

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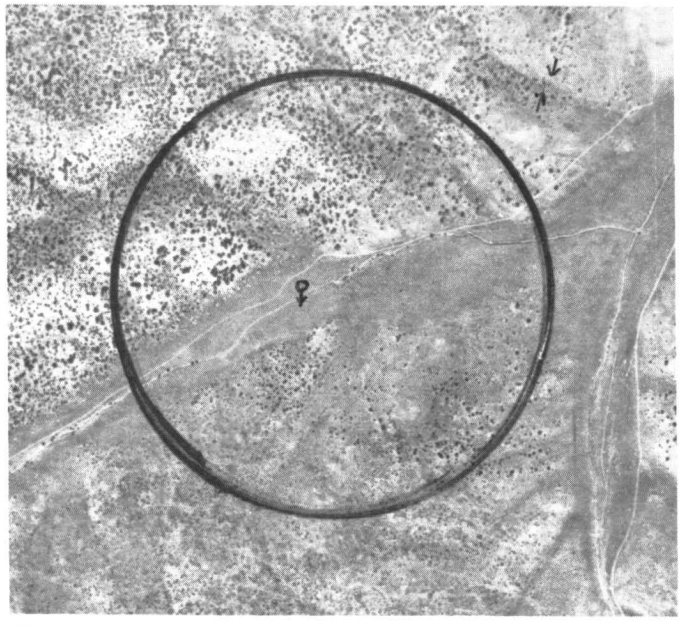
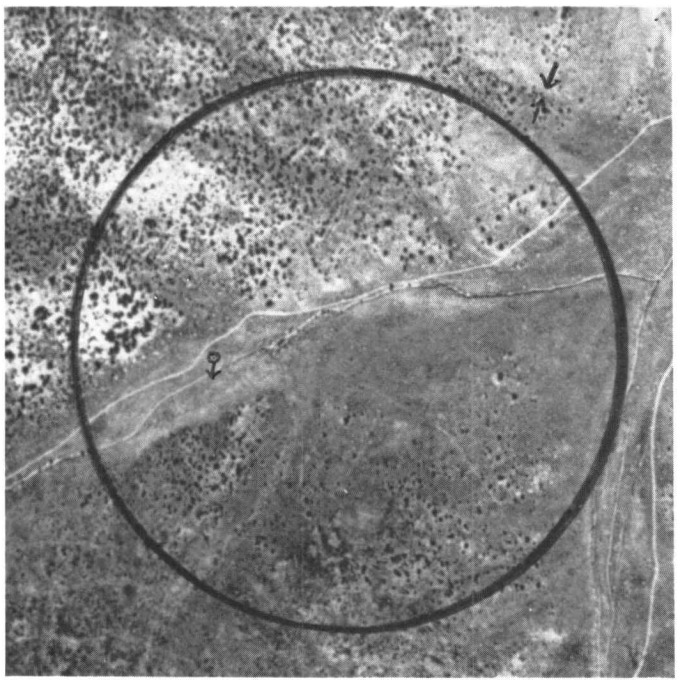
This series of four photographs is all of the same area. The on-the-ground-photographs were taken where the arrow/circle (0→) symbol is shown on the aerial photograph.



Picture 1
1:20,000 black and white air photo taken in April 1974. A grazing system was started in 1974. Note even tone and fence line contrast (arrows).

Picture 2
On the ground 1973 trend photo. Note good grass cover. This is what ground cover conditions were like in picture 1.



Picture 3
1:15,000 October 1976 color infrared air photo. Note the lightening of the tone. Down trend, again note fenceline contrast (arrows).).

Picture 4
On-the-ground photo 1977 showing large loss of western wheat grass. Ground cover was reduced from 6 units to 1 unit in plot and transect. High utilization and drought is the reason for loss. This is what ground cover conditions were like when picture 3 was taken from the air.

would involve the complete selection of key areas throughout an administered area. Trend would be read every year for a 3 to 5-year period to get the "pulse" of the range. After this has been done, the high altitude aerial photography could be evaluated every succeeding 5 years by observing key areas on the aerial film. If there has been a significant shift in the tone, field crews could be sent to the site to read trend. The key areas where no tone shift has occurred left them remain unread as there is no significant shift in condition.

Another method of use would be to, every 5 years, evaluate the film and read 10 to 20% of the trend measurement areas. Reading of the 10 to 20% of the plot would pick up any contradictions that may occur in interpreting the tone and condition and would continue to refine the method.

Conclusion

The use of high altitude photography could be used to detect significant shift in trend quality. One cannot quantify the species lost or gained and that would have to be obtained in the field where tone showed big shifts.

This method, however, could bring savings in manpower and gasoline in the future.

The savings would come as fewer trend plots would have to be read yet any significant shifts would be picked up on the film and could be checked in the field. With plans to greatly expand trend measurement areas over the whole of public lands, this is a tool to reduce vehicle use and manpower needs. ●

Conference on Ecological Modelling

The Third International Conference on State-of-the-Art in Ecological Modelling will be held from Monday, May 24, until Friday, May 28. The theme of this international conference will be "Application of Ecological Modelling to Environmental Management." Besides technical papers, there will be a strong emphasis on case studies. Abstracts of 200–500 words should be forwarded by December 15, 1981 to either Prof. Gaylord. V. Skogerboe or Prof. William K. Lauenroth, Natural Resources Ecology Laboratory, Colorado State University, Fort Collins, Colorado 80523.

Some of the technical subject areas proposed for this conference are: model identification, development, parameter estimates, stability, validation, and verification; model applications to lake and river systems, wetlands, forests, grasslands, etc; and case studies, such as the Baltic Sea, Great Lakes, Rhine River etc.

Goats Much Maligned but Necessary

James A. (Al) Martin and Donald L. Huss

Except for the dog, the goat has the widest ecological range of any domestic animal. Goats can cope with a variety of dietary alternatives and they can flourish on forages and feeds, including kitchen refuse, that would otherwise be wasted. Goats are valuable for milk, meat, fiber, and leather and millions of people depend upon them for their livelihood. They are often called the poor man's cow because two does bred at alternate intervals can provide a family with a year-long supply of milk and their small size and relatively low cost makes them available to small farmers who have neither space nor capital for a cow. Their productivities can be astounding. For example, a lifetime record holding doe in Britain produced 16,968 kg (37,330 lb) of milk in 2,966 lactating days, an average of 5.7 kg (12.5 lb) per day. As a general rule, fertility is no problem and twinning or more than one gestation per year is quite common.

In spite of these attributes, the goat is the subject of a world-wide controversy and there are two opposing views about their role in land use. These are best expressed by quotations from two early references regarding the subject. Sir Daniel Hall in delivering the Heath Clark lectures for 1935 at the University of London, said: "The greatest danger, however, lies in the fact that overgrazing may so destroy the vegetation and bare the surface that soil erosion sets in. . . of all livestock the goats are the worst offenders. . . . The brunt of the campaign against overstocking should fall on the goats. . ." (Hall 1936). This view has been echoed by many sources since that time and in many cases goats have been categorically blamed as the cause of deforestation, rangeland destruction, erosion and desertification. Laws have been passed in some countries prohibiting the grazing of goats in certain areas and goat eradication campaigns have even been launched.

At about the same time that Hall was delivering his lectures, Hornby (1936) wrote: "The goat is often referred to as though its depredations exceeded those of other animals. This is not quite fair. The cattle and sheep have created a wilderness of gullies separated by dry ridges bearing nothing in the way of vegetation but the hardiest of shrubs, the cattle and sheep have departed with the last of the grass, the goat still to be found and as he valiantly extracts a livelihood where no other animal can live, he undoubtedly makes yet steeper the sides of gullies, and appears to be doing his best to remove the last of the plants and with them the last of the soil. But in reality, he is merely completing the destruction wrought by sheep, cattle, donkeys and man." This view has also been echoed by others and the goat has been defended on the grounds that the problem of vegetation deterioration does not lie with the goat *per se,* but rather instead with uncontrolled grazing and thus man is the true culprit.

We tend to agree with the latter view. To categorically blame the goat as though it has some special character which brings about vast destruction of pasture and forest resources is considered an unrealistic approach. A more realistic approach is a thorough understanding of the goat so that it can be placed into a rationalized grazing programme. However, the concern over the continued overgrazing with goats is justified. In some areas the appropriate question may be: "What other kind of livestock do we have to graze these lands with when goat pasturage is destroyed?" This stage has already been reached in vast areas of the Near East and now only the camel can survive.

While goats have many characteristics which make them suitable for various kinds of grazing programmes, their relationship with browse utilization deserves special consideration and is given major emphasis here. We have observed in many parts of the world that goats tend to graze woody species more than they do herbaceous ones, especially in respect to specific species. This has been supported by the literature. Wilson (1969) concluded from his review of the literature that goats eat more browse than sheep which in turn eat more than cattle. Edwards (1948) observed in Africa that goats never grazed grasses during the period of shrub leaf flush and Carrera (1969) reported that goats almost exclusively consumed browse in the arid zones of Mexico.

McMaham (1964) observed one goat's grazing behaviour in pastures in Texas with histories of heavy, moderate, light and no grazing use and concluded that browse constituted more than 50% of the annual diet regardless of past grazing use or forage availability. Huss et al. (1970) observed in a

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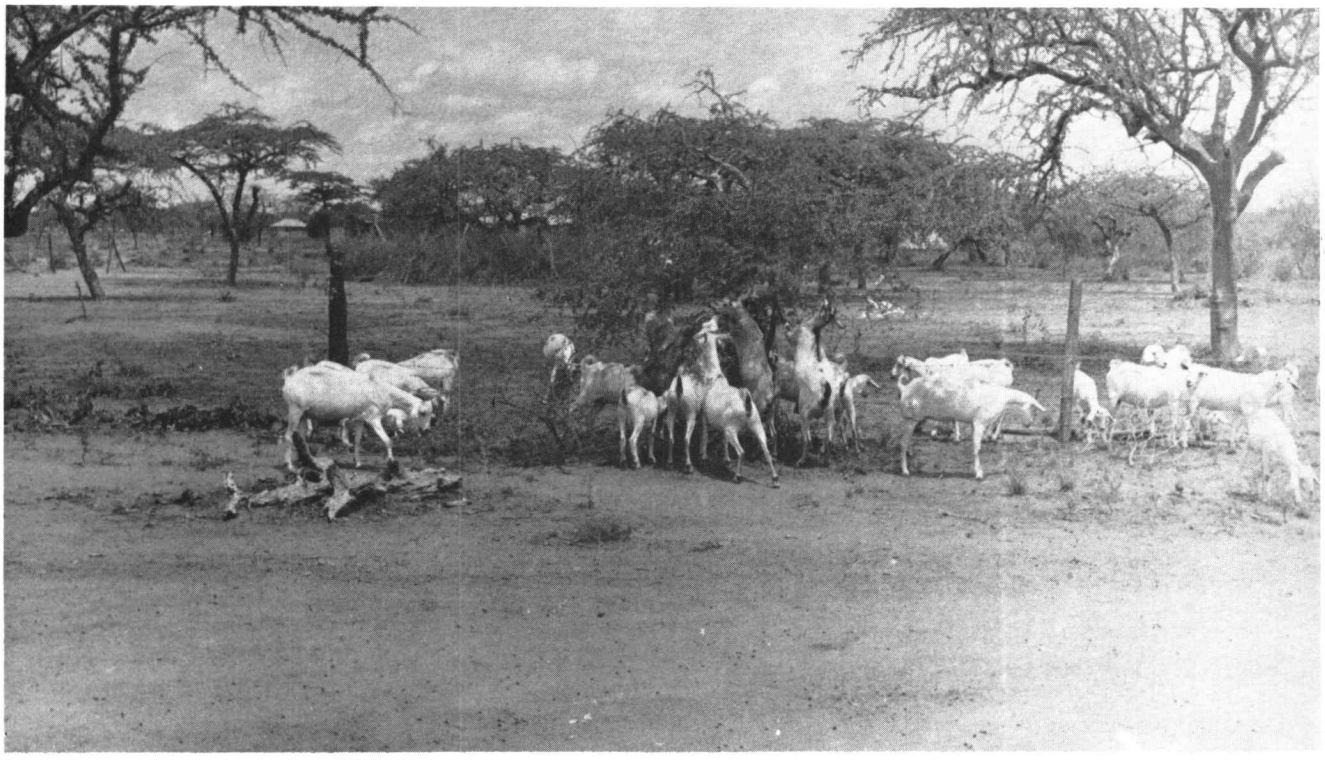
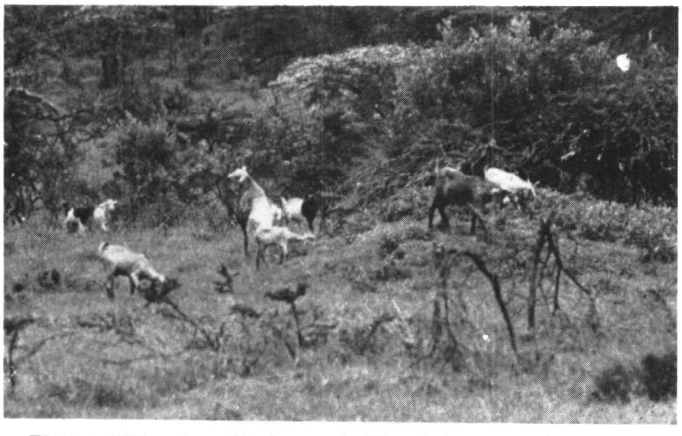


Overgrazing by cattle and sheep has deteriorated this range in Kenya to a state where only the goat can survive, yet the goat is blamed for it all. (Photo by Huss).

study near Montemorelos, Nuevo Leon, Mexico, that goats preferred browse even when exposed to an abundance of palatable grass species.

Why the goat eats browse when other domestic livestock will not is a subject warranting more research. It is possible that this is due to its nutritional requirements as some studies have indicated. On the other hand, it could be due to the character of the goat's mouth. Their mobile upper lips and prehensible tongues permit them to eat tiny leaves of browse, even spiny species, which other animals cannot normally consume. Regardless of the reason or reasons, the fact that goats show a preference for shrubs and can consume many of them is an attribute that can be beneficially exploited.

For example, it has been illustrated the goats can be economically used in brush control programmes which result in improved vegetation composition for cattle and sheep. Magee (1957) made an economic evaluation of 15 ranches that were using goats to control sprouts on cleared land on the Grand Prairie of Texas and he found that they not only prevented or retarded brush regeneration, they paid for the original cost of clearing as well. They have been used to control oak brush on the Edwards Plateau of Texas and they have been successfully used as an adjunct to other brush control methods (roller cutting and burning) in Mexico. In case of the latter, they eliminated the regrowth of some woody species and retarded the regrowth of others without harming the natural regeneration of desirable grasses (Huss et al. 1970). We have also observed that the goat plays an important role in brush control in Tanzania's Masailand. In addition, the small Masai goat provides most of the meat for the local people because their cattle are used only for celebrations, for selling, or for trading for wives.



The small Masai goat helps control brush by preventing its expansion thus helping to maintain cattle pasturage (Photo by Martin).

Based on our experiences in many parts of the world, (U.S., Africa, Near East, and Latin America), we believe that there are many areas where goats need to be used intensively and wisely to control brush, to upgrade the environment, to help prevent both grassland and forest fires, and to increase food production. Some of the areas, for example, are the Chaparral areas of California; oak brushlands of Texas, Oklahoma, and the mountain states; the brushlands of Mexico and Latin America including the wet tropics; the Sahel and Sudanian regions of Africa and the East African bush.

The use of goats would likely be a more effective and economical alternative for the control of many brush species than either chemical or mechanical methods. Their use would definitely require less energy and they would not present a pollution problem. Moreover, they would produce consumable products in the interim which, in light of the world's ever increasing demand for food, is a noble contribution in itself.

There is an urgent need for more studies regarding

managerial procedures required for controlling brush with goats as well as ways and means for obtaining maximum milk and meat production during the process. Yes, goats have been much maligned but they are very necessary.

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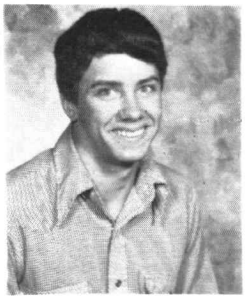
The Range Cow: An Energy Efficient Food Producer

Reeves Brown



As our supply of fossil fuel continues to decrease and prices soar at an ever increasing rate, only the energy efficient will emerge to survive in today's world. One of the most energy efficient producers that we have is the range cow. With her ability to convert forage and roughage into food, she is an efficient user of much of our rangeland. Besides providing us with a source of highly nutritious food, the range cow supplies hides, the source of many leather goods in use every day. She also provides numerous other by-products used by our society such as insulin, soap, glue, china, hairbrushes, and violin strings.

It is true that the range cow is a source of numerous goods but one may ask, "Is she truly energy efficient?" Let's take a close look at her: Her average life span covers about 12 years. Most of her days are spent grazing the rangeland. Her lifetime work is raising about ten calves.

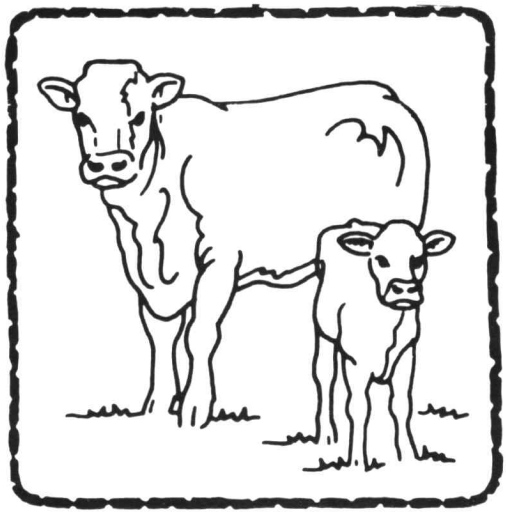
With proper livestock management, she will give birth to a calf every spring. The following 6 months each year, the cow will nurse and look after the calf while it gains about 2 pounds every day. Come October the cow will have produced approximately 500 pounds of calf. Mother range cow repeats this production cycle over again and again, then usually ends up as hamburger, steak, and roasts herself when her productive life is over.

For every range cow, this adds up to over 3,000 pounds of beef for our dinner tables plus the hides and other discards used by the clothing and medical industries. Fresh beef continues as the top sales item in grocery stores accounting for over $16 billion or about nine percent of all grocery store sales in 1979. Well over $30 billion worth of beef was consumed in the United States in 1979.

The author is 17 years old, a high school senior, Lewistown, Montana, Northern Great Plains Section. This report was given at the Youth Range Forum-Slide Talk Competition and Judged First Place, SRM Annual Meeting, Tulsa, Oklahoma February 11, 1981.

This transformation calls for very little fossil fuel directly assignable to the range cow. During those 12 years the cow travels about on her own four, converting grass into milk, meat, and hide. The rancher looks after these mobile grass harvesters with little expended energy from fossil fuel. Most herding and doctoring is done on horseback. The horse eats the same grass and drinks the same water as does the range cow. About the only fossil fuel expended directly to the range cow is that used in providing her hay for a few months during the winter (Montana) and for truck transportation when she heads for market. In many cases she trails to market as in the past.

In order to get the maximum and most economical production of red meat from the range cow, we will have to use our range resource more wisely. Let's take a close look at this land base called rangeland.



There are approximately 750 million acres of rangeland in the continental United States. The big majority of it is in the seventeen western states. It supports annual and perennial native plants suitable for grazing.

The harvest system for such forage which is the least energy intensive is that of the grazing cow and sheep. The range grass captures solar energy and converts it into a chemical energy which the range cow in turn converts into a high protein meat—a dietary base that keeps this nation one of the healthiest in the world.

Native grass is the cheapest of all feeds and provides the greatest amount of total digestible nutrients for the money. This is the main reason that much of the rangeland has been overused. A national survey made two years ago indicated that about one-half of our rangeland is in less than good condition with vegetation production estimated to be only about forty percent of potential. In other words, we have the potential to increase substantially the red meat production in this country by improving our rangelands through range management practices. Going about increasing range production varies with the area and the ranch operation. One can normally figure that it will be economically feasible to apply improved management practices where remnants of desirable species occur. Sometimes this may require consulting the opinion of a range specialist.

In most cases, improved range condition and production will come with cross-fencing, developing ample livestock water and implementing a grazing system designed around the plants' needs. In some areas additional improvements may be needed such as brush management control or reseeding.

A sizable portion of our rangeland is publicly owned. This public land provides about 17% of the total forage needed for beef production in the eleven western states. Today, many are advocating the removal of the range cow from public lands to reserve and protect these lands for other uses such as recreation and wildlife. Actually, many proper livestock grazing practices are compatible and complementary with other range uses. Livestock, especially cattle, have been used as a management tool to improve wildlife habitat and range condition. Improved range condition will improve production, promote diverse wildlife habitat and improve the condition of watersheds. Elimination of the range cow from public lands would remove a sizable food producing resource base, increase the dependence on high-cost feedlot feeding and cause a considerable increase in the price of beef at the store.

Because of our large amount of rangeland in the United States, our beef costs are one of the cheapest in the world. Today, in Japan, for example, boneless sirloin is over $15 a pound, in Germany it is over $6 a pound, and in England $5 a pound, while in the United States we can purchase it for $3.67.

In summary, if we improve and maintain high forage production on both private ahd public rangelands, the energy efficient cow will continue to provide an ample source of high protein meat and other products at affordable prices for present and future generations. ●

Better Oral Communications for Range Managers Series—No. 6

Speaking Aids. . . or Distractions?

Kendall L. Johnson

Because it is such a natural thing to do, nearly all public speakers have used aids or props in the course of a talk. Properly used, such speaking aids can be very effective in illustrating a concept, making a point or closing an idea—in short, making a favorable impression on the audience.

But therein lies the rub. Too seldom are speaking aids used properly. Too often do they become simply an impediment—a distraction—to the speaker's message. Examples abound. How often have you, as a member of an audience, watched a speaker hold up an object as an illustration only to find that it was too small to appreciate its significance? How many times have you watched speakers using lantern or overhead projectors fill the screen with ranks of words or columns of figures too small to be seen easily from anywhere in the room? How many slides have you seen too misexposed, too ill-focused, or too badly composed to illustrate their intended points? Remember the feelings of irritation or resignation, or more likely, disinterest resulting from such events?

These reactions were produced by your inability to readily learn the point of the speaking aid. Very likely, they resulted in your losing track of what the speaker was saying. More properly, the speaker lost you, and thereby committed the fundamental error of public speaking: creating a condition wherein attention of the listener was diverted from the intent of the talk. Where use of audio-visual aids helped to create that condition, the speaker would have been better off not using them at all.

There is a better way, a much better way. A way calculated to make use of speaking aids just that—aids, not distractions. To the extent the potential of such aids can be achieved, to that same extent will the impression of the talk, and therefore its message, be enhanced.

Most speaking aids are visible rather than audible, ranging from brief and occasional use of objects to full-scale slide talks when words become almost secondary to pictures. The rules governing effective use of both visible and audible props are few and simple, but vital. They begin with the basic imperative that nothing used in the course of a talk should divert attention to itself—that is, create a distraction—instead of focusing attention on the point being illustrated. Judge every potential aid by that standard. Visual aids will most often meet the standard if they are (1) big, (2) simple, and (3) imaginative.

1. Make it big. The first requirement of any visual aid is that it be large enough to be readily seen and understood by all members of the audience. The requirement applies to all forms of visual aids. For example, if your talk calls for use of a ballon, find a big balloon and have it filled beforehand (perhaps with helium) so as to make the fact that it is a balloon—and what that illustrates or reinforces—inescapable. If you're writing on a chalkboard or easel, do it boldly. If you're using

The author is an extension range specialist, Utah State University, Logan.

lantern or overhead projectors, make sure that what is projected can be easily seen and immediately recognized.

If possible, try the visual aid out before the talk. Have someone hold up the object, write on the board, or project the slide, and then see whether each can be easily recognized from the most distant corners of the room. If it cannot be easily recognized, make it bigger or do not use it! You'll be surprised how many prospective visual aids will be changed or ruled out by this simple test. But the surviving aids will reinforce the talk and help it proceed smoothly without the distraction of listeners wondering what that object is, or what you're doing. Remember that no speaker can afford to deliberately create feelings or irritation, or what is worse, disinterest in any member of the audience, even those in far corners of the room.

2. Keep it simple. A second requirement of any visual aid is that it be simple or uncomplicated, so that its point can be readily understood by all members of the audience. Subject every potential visual aid to the mental question: Is it more complicated than it needs to be to illustrate the point? If it is, find some way to simplify it, or replace it entirely. This inspection will help you weed out objects requiring detailed explanation, too-busy displays, slides or transparencies, and complicated models.

Remember that listeners have only a brief, one-time opportunity to grasp the significance of the visual aid. If the point can't be illustrated simply, don't illustrate it at all. The talk will be far better off relying on well-delivered words alone, avoiding the possibility of a serious distraction.

3. Make it imaginative. The fundamental reason to use props in the course of a talk is to make its points more understandable, or to give them added emphasis. Therefore, speakers can profit from imagination in selecting or devising visual aids. For instance, instead of using only black-and-white transparencies on overhead projectors, why not use color? A host of semi-transparent objects can be projected on an overhead, often in vivid color. Even opaque objects often project interesting outlines, and can frequently be used to meet the requirements of adequate size as well.

If you choose to use a visual aid to illustrate a point, and are satisfied that it is both large enough and simple enough, then make it as colorful, as dramatic—as eye-catching—as possible. Not only will such vividness help underline the point, but it will also help maintain attention of the audience generally. An imaginative use of big and simple visual aids is often the difference between an effective talk—one that makes an impression—and just a talk.

Big, simple and imaginative are the hallmarks of effective visual aids. Parallel criteria can be applied to the use of sounds as speaking aids. First, determine whether the sound you hope to use can be easily heard in the most distant corners of the room. Second, make sure the sound is clear and can be immediately recognized. If it is not loud enough or clear enough, make it so or do not use it! And third, use sounds as colorful, as dramatic—as ear-catching—as possible. An imaginative use of sound will engage the attention of

an audience more quickly than any other speaking aid. Caution: do not leave your listeners puzzling over a strange or unfamiliar sound; the distraction will be devastating to the attention you must maintain. Loud, clear and engaging are the characteristics of effective audible speaking aids.

The speaker who employs effective audio-visual aids to the spoken message will more likely make a favorable impression—the basic goal of all public speaking. All of us enjoy a thoughtful, fresh approach, especially to common or familiar things, and all of us will react favorably to a speaker making effective use of speaking aids. The speaker who engages us with props will be using aids, not distractions.

Special Notice!!

Due to reassignment and different responsibilities, *Doug Sellars* will no longer be able to continue as chairman, Membership Committee. **Joe B. Norris** has been appointed to be chairman by President Merrill and to put special emphasis on membership recruitment and retention. Doug will continue on the Committee, emphasizing efforts to obtain greater benefits for members of SRM such as discounts for car rentals and motels.

The address and telephone number of the new Chairman, Membership Committee, is:

Joe B. Norris
Soil Conservation Service
Box 2466
Abilene, Texas 79604

Dust from an Alkali Flat

Basil K. Crane
$7.00

An interesting, humorous down-to-earth collection of true stories from Crane's Forest Ranger days on the Toyabe National Forest in Nevada ". . .during the perpetual feud over grazing permits on the National Forest. . . ." It is not about range problems or grazing policies. It is about people, horses, mules, and work, ". . . just telling it like it was when a job was a job, before the days of Personnel Officers and Personnel Management Programs in the Forest Service. . ." during the 1940's.

Available from a few book stores or order direct from *Basil Crane, Route 2, Preston, Idaho 83263. Mr. Crane is a charter member of SRM.*

Periodic Burning Enhances Utilization of Grass Type Conversions

Mike Dennis

Effectively utilizing the long established perennial grass type conversions on the Stonyford District, Mendocino National Forest, in northern California, has evolved into a critical problem. The most significant problem is the increasing recovery of brush and the related poor utilization of grass by livestock. Faced with the critical controversy over the use of herbicides on public lands and the high cost of mechanical treatment, additional cost-effective techniques to control brush encroachment and renovate the pastures are needed.

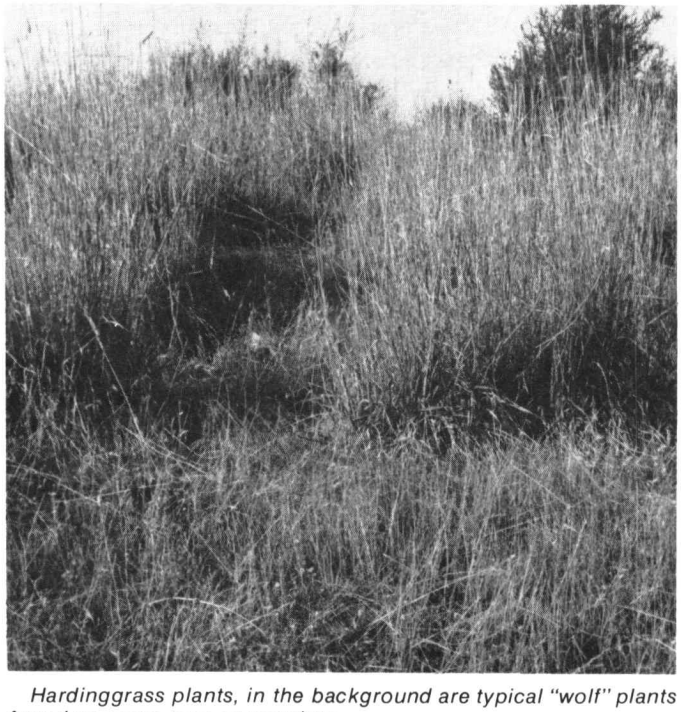
The Big Stony type conversion was initially selected for an experimental trial to control brush encroachment and re-establish the vigor and management of the pasture. The type conversion was established in 1962. Approximately 180 acres of chamise *(Adenostoma fasciculatum)* dominated chaparral was successively crushed, burned, disked and seeded between 1962 and 1963.

Soils underlying the area are predominately in the Stonyford series and texture ranges from clay/clay loam to gravelly clay. The effective rooting depth ranges from 25″ to 45″ and the depth to a fractured basaltic bedrock averages 50″. Inherent fertility is moderate to low and the pH is neutral. Slopes range from 2 to 20 percent. Average annual precipitation is 25″ - 30″, occurring mainly between November and May. The average elevation is 1,600 ft.

The area was drill seeded almost entirely in Hardinggrass *(Phalaris tuberosa var. stenoptera)* at a rate of 5 lb/acre. Approximately 80 acres was additionally seeded with rose clover *(Trifolium hirtiglumus)* at a rate of 8 lb/acre. Although dominated by Hardinggrass, annual grasses and forbs have become well established between the perennials. Soft chess *(Bromus mollis)*, annual fescue *(Festuca megaleura)*, slender oats *(Avena barbata)*, red-stem filaree *(Erodium cicutarium)* and bur clover *(Medicago hispida)* are predominant in the annual community. Yellow star thistle *(Centaurea solstitialis)* is evident as a late-maturing summer annual.

Since 1963, seedling and crown sprouting brush invading the pasture was sprayed with 2-4-D herbicide twice (1965, 1967). Spraying was done by helicopter and control was reported to have been complete and effective. The type conversion again needed maintenance by 1975, but with the controversy over herbicide use increasing, respraying the invading brush was neglected. Consequently, brush encroachment from resprout and seedlings is threatening the vegetative conversion. The majority of brush species are chamise, buck brush *(Ceonothus cuneatus)* manzanita *(Arctostaphlos manzanita)* and Yerba Santa *(Eriodictyon californicum)*. Of the four, chamise and Yerba Santa are crown sprouters, with chamise also being an avid reseeder.

The effects of brush re-invasion were (1) about 20% of the available grazing area was lost, (2) livestock tended to graze the more open areas and avoid the forage adjacent to and under the brush and (3) ungrazed or poorly grazed Hardinggrass plants become "wolf" plants which showed no signs of tillering. Green forage, produced in the mass of dry material, could not be grazed. The situation gradually evolved into a scenario of underutilized "wolf" plants and proliferating less desirable annuals; aggravated by the re-invasion of undesirable brush species.



Hardinggrass plants, in the background are typical "wolf" plants found on some type conversions.

Burning to Control Wolf Plants and Brush Invasion

The entire 180 acres of the brush-grass type conversion was burned by hand crews in late October 1979. By that time, .66″ of precipitation had been received, which was adequate to stimulate germination of annual grasses and forbs beneath the litter. Typical of a grass burn, the fire spread and burned quickly, consuming the majority of dry perennial growth and annual grass litter. It was interesting to note, however, that germinating annual plants under the litter were

Author is Resource/Range Officer, U.S. Forest Service, Mendocino National Forest, Stonyford Ranger District, Ladoga Road, Stonyford, California 95979.

not visibly affected by the fire. Clumped perennial grass "wolf" plants provided enough fuel to ignite some brush. This was particularly obvious where the brush limited utilization of the grasses by livestock and more dry fuel was available.

In the trial area sampled, some form of control was obvious on about 41% of the brush. Underburning the grass had four effects on brush:

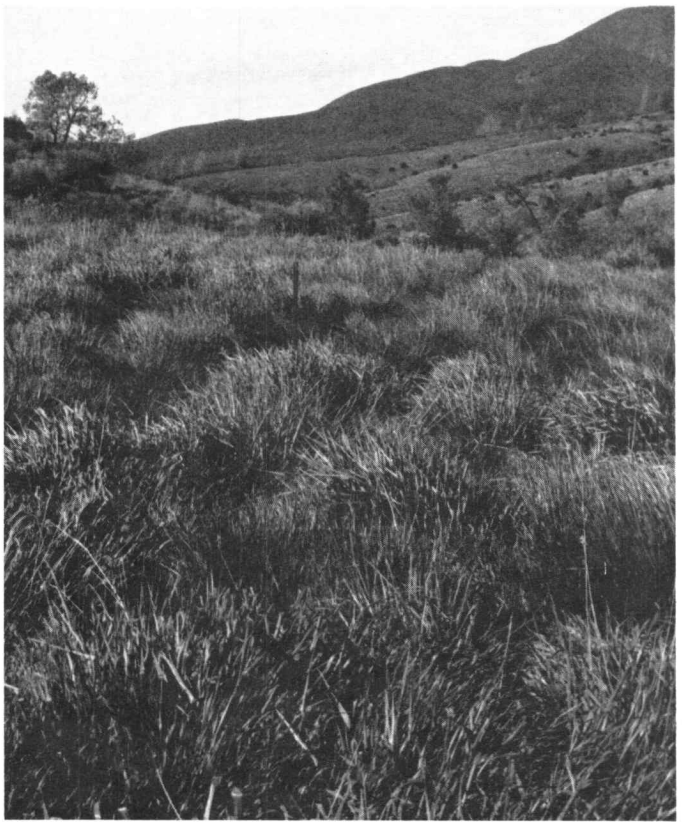
1. Some mature plants ignited and were totally consumed.
2. Only dead branches and litter burned on some.
3. Brush seedlings were totally consumed.
4. Low intensity underburning did retard the growth on some plants (principally manzanita).

At least 80% of all dry leaves and stems were burned off the Hardinggrass plants. More than 80% of the annual litter was also consumed. Growth of foliage on perennial plants was evident as little as three days after the burning.

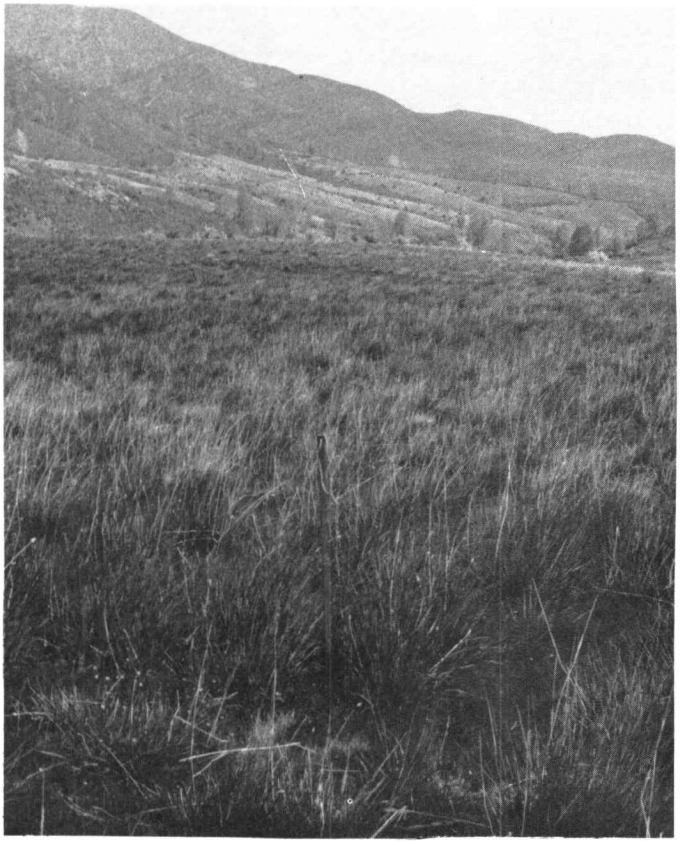
Forty acres of the burned area was fertilized with approximately 300 lb per acre of ammonium phosphate (16-20-0) between late October and early November.

The immediate effect of burning, besides eliminating some competitive brush plants, was the removal of a large amount of essentially ungrazable overgrowth. Observation of livestock grazing habits and post-season evaluations show that clumped Hardinggrass is not grazed. The majority of green foliage was intermixed in the clumps of dry material and coarse stems and was therefore not available as forage.

The amount of available forage almost doubled. Significant growth was measured on the burned plants as the season progressed. This may be due in part to a released flush of nutrients for plant use from the ash and the removal of the constricting influence of the matted stems and dry foliage. By late spring, evidence of lateral plant expansion (not seen in the "wolf" plants) was common in all burned pastures. When grazed, the pasture was evaluated as receiving moderate but even use, particularly where some degree of brush control was achieved.



After burning, 300 lb/acre of ammonium phosphate (16-20-0) was applied to this Hardinggrass pasture. Production was estimated at 6,776 lb/acre of usable forage or 7.53 cow months per acre.



This burned and unfertilized Hardinggrass pasture has an estimated production of 3,331 lb/acre usuable forage (or 3.7 cow months/acre).

Fertilization of the 40-acre trial showed a marked increase in forage production and condition. Late season evaluations documented significant lateral plant expansion, greater seed cast and concentrated but even livestock use. Fertilization as a spot-burn treatment afforded the following results:

- Production of usable forage doubled in burned but unfertilized pastures and tripled in burned and fertilized pastures.
- Increased tillering was stimulated.
- Seed production was heavier than non-treated plants.
- Fertilized annuals growing between the perennial plants received more grazing use, reducing the selective pressure on perennials.
- Deferment of livestock was not required to assure perennial pasture recovery in this instance.
- Carry over of nutrients is evident for the second season and predicted for the third season.

Cost Data and Conclusions

The hand burning of perennial grass/brush type conversions cost $5.50/acre. Compared to the $18.50/acre cost for herbicide applications, and $29/acre for mechanical treatment with a gyrocutter, burning of some perennial stands is a viable, cost-effective tool for brush reduction in established

type conversions. When coupled with a program of deferment and fertilization, the increased fuel developed by perennial and annual grasses, will assure a higher level of control on brush when burned.

Fertilization of rangeland has prompted some debate over the cost effectiveness of the practice. Based on current prices, the application of 300 lb/acre of ammonium phosphate would cost approximately $12.00/acre. With the predicted 3-year effectiveness of the practice, it would amount to a $4.00 acre per year investment. The range manager's decision to fertilize must be tempered with the multiplicity of benefits expected.

Fertilization merely for the sake of increasing production is a valuable but limited goal. However, the investment in fertilizer is often justified when coupled with the ulterior benefits of reestablishing or supplementing soil nutrients, providing an increase in the quantity/quality of forage in key wildlife areas, and stimulating a concentrated build-up of fuel for underburning.

The burning and fertilizer trials on the Big Stony type conversion were evaluated as an alternative to spraying for brush encroachment along with post-burning responses and accelerated recovery techniques for perennial grasses. Several notable conclusions were drawn:

1. Seasonal burning of annual or perennial grasses is a viable tool for controlling brush reinvasion in key range areas.
2. Perennial plants respond to burning with accelerated growth, lateral plant development, increased forage production and improving the availability of forage to livestock or wildlife.
3. The early removal of annual plant litter eliminates some competition to the proliferation of perennials.
4. When used in conjunction with burning, fertilization can speed-up recovery, improve forage conditions and provide fuel for late season burning.
5. Scattered buck brush plants *(Ceanothus cuneatus)* fertilized along with the pasture showed definite signs of heavy deer browsing and hedging.
6. The burning/fertilizing/brush control management of Big Stony redeveloped the type conversion as a key grazing area. Grazing use tripled, not only increasing the number of livestock, but extending the season of use (30 days beyond usual use). This is *significant* in so much as it reduced the early grazing pressure on native meadows and glades. Total deferment of pasture was *not* needed to assure recovery to the type conversion.

Acknowledgements:
Bob Moore, Fire Management Officer, Stonyford Ranger District
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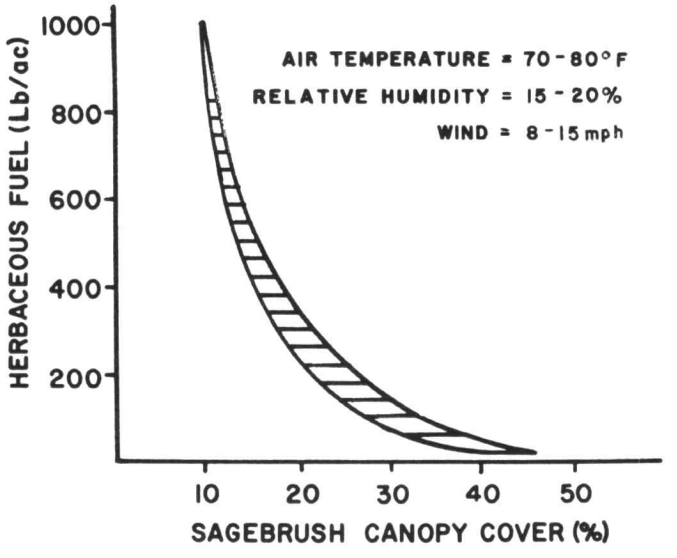
Will Your Sagebrush Range Burn?

Carlton M. Britton, Robert G. Clark, and Forrest A. Sneva

Currently, many sagebrush-bunchgrass communities of the Great Basin are virtual monocultures of big sagebrush *(Artemisia tridentata)*. This condition results in reduced herbaceous production and minimal habitat diversity. When management objectives include reduction of sagebrush density, prescribed fire provides an ecologically sound vegetation manipulation tool. Unfortunately, prescribed fire cannot be used to treat all sagebrush-bunchgrass communities. This paper presents a simple technique which will allow range managers to determine if a particular area can be burned under prescribed conditions. This technique is based on the relative amounts of herbaceous fuel (grasses and forbs) and the canopy cover of big sagebrush necessary to ensure fire spread.

The Relationship

The curve presented represents the relationship between sagebrush canopy cover and herbaceous fuel at which safe and successful prescribed burns can be expected. This relationship will hold when wind is 8 to 15 mph, relative humidity is 15 to 20%, and air temperature is 70 to 80° F. If burns are



Relationship of sagebrush canopy cover and herbaceous fuel load. Curve represents proportions of the two parameters where successful burns can be expected for the given conditions.

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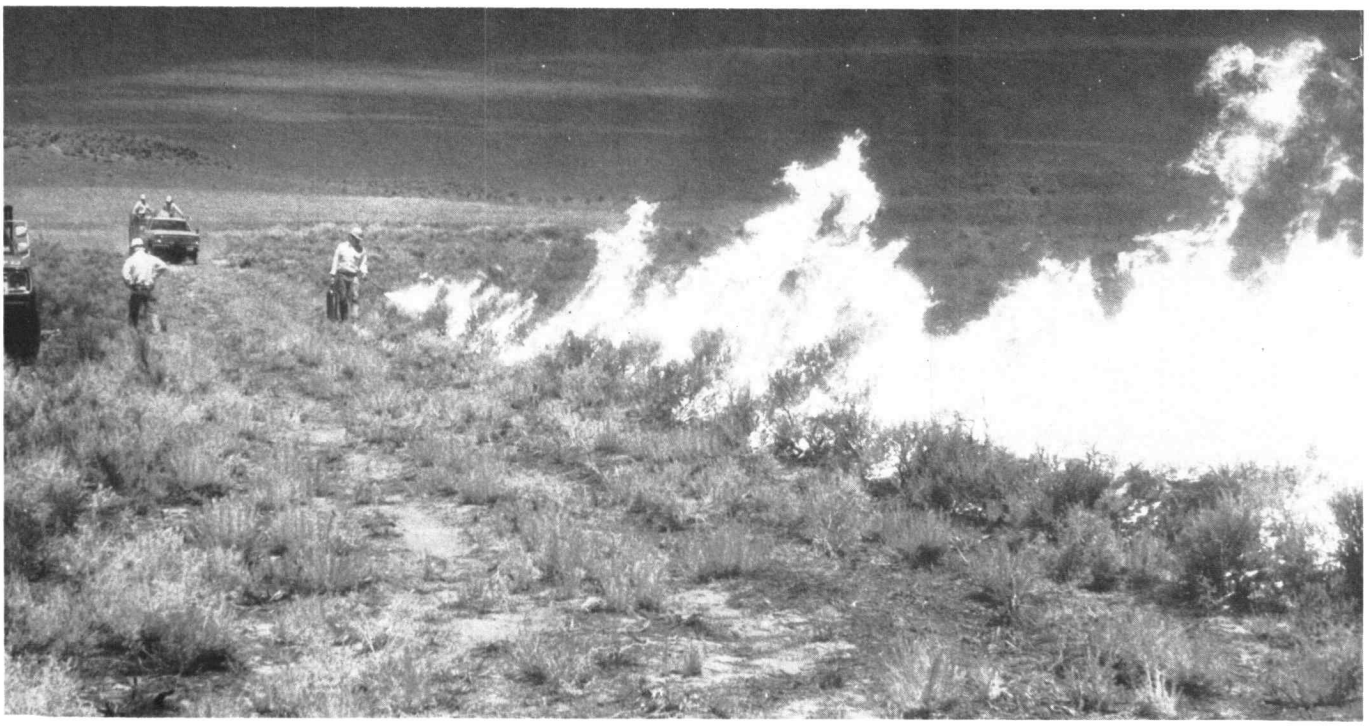
This paper involved a cooperative effort of Eastern Oregon Agricultural Research Center and U.S. Department of Agriculture, SEA-AR, Burns, Oregon 97720. Technical Paper Number 5726, Oregon Agricultural Experiment Station.



Burning to reduce sagebrush canopy cover in eastern Oregon.

conducted with higher winds and air temperatures at lower humidities, the curve will shift to the left. This implies that areas with lower fuel quantities could be burned, but control of the fire might be difficult. The curve will shift to the right when burns are conducted with lower winds and air temperatures in conjunction with higher humidities. Therefore, higher fuel quantities are required to ensure fire spread. As a general rule, at least 20% canopy cover of big sagebrush and 200 to 300 pounds per acre of herbaceous fuel is needed to ensure a successful prescribed burn.

The more productive the site, the greater the canopy cover of big sagebrush and herbaceous fuel. Therefore, subspecies of big sagebrush can be used as an initial evaluation of whether or not an area can be successfully burned. Mountain big sagebrush *(A.t.* subsp. *vaseyana)* is most easily burned. Basin big sagebrush *(A.t.* subsp. *tridentata)* is intermediate and Wyoming big sagebrush *(A.t.* subsp. *wyomingensis)* is most difficult to burn. These differences are not related to any specific attribute of individual plants but rather to sites where the subspecies occur. Mountain big sagebrush and basin big sagebrush typically occupy deeper soils that generally receive more precipitation compared to Wyoming big sagebrush. Thus, the better sites are capable of supporting greater plant densities. This results in more sagebrush canopy cover and herbaceous fuel. In sagebrush-bunchgrass communities, the more fuel that is available, the easier it is to conduct safe and effective burns.

To verify the relationship a test burn was conducted on an area with five levels of sagebrush canopy cover and herbaceous fuel. Results substantiated the limit of 20% sagebrush canopy cover when the herbaceous fuel is primarily bunchgrasses. However, with 800 to 1,000 pounds per acre of cheatgrass, no sagebrush canopy cover is necessary to ensure fire spread. This area was burned without firelines. The fire front moved from the area with herbaceous fuel to an adjacent area that had been closely grazed the prior week. The fire front would not move into the grazed area even though the canopy cover of big sagebrush was 15 to 20% at the boundary. One growing season after this October test fire, herbaceous yield was compared for the burned and adjacent grazed areas. The burned area produced 696 pounds per acre compared to the grazed area at 490 pounds per acre. Both areas had a history of light, late season use for the past 30 years.

An August test burn was attempted on an area with 500 pounds per acre of herbaceous fuel and 7 to 11% canopy cover of Wyoming big sagebrush. Wind was steady at 26 mph, relative humdity was 13%, and air temperature was 86° F. Under these conditions, the fire would not spread more than 30 feet when ignited with a drip torch. Another test burn was conducted on an area with about 100 pounds per acre of herbaceous fuel and 38% canopy cover of sagebrush. Wind was 4 to 6 mph, relative humidity was 18%, and air temperature was 79° F. This fire spread very well (about 18 feet per minute) until the front hit a transition where the sagebrush canopy cover dropped to 11%. At this point the fire front broke up and did not penetrate this reduced canopy cover more than 20 feet.

Benefits

Critical examination of canopy cover and herbaceous fuel on a sagebrush-bunchgrass range can prevent wasted effort in planning and conducting a prescribed burn. Areas where the fuel is not adequate for prescribed fire can be deleted from consideration. Areas with various levels of sagebrush canopy cover can be evaluated with respect to what areas will burn and those which likely will not. Those parcels that will not burn will leave a mosaic of vegetation that provides habitat diversity.

In planning firelines for a prescribed burn, areas with low fuel amounts can be left or minimal efforts devoted to line construction. This will save time and money and provide discontinuities in the appearance of other more intensely prepared firelines. ●

University of Texas Range Management Plan

A Premium on Livestock Management

Dale D. Allen

Improving rangeland on 2.1 million acres of state school land in Texas is now being accomplished in a cooperative effort by the University of Texas Board of Regents and the U.S. Department of Agriculture Soil Conservation Service (SCS).

The no-nonsense conservation policy was implemented in 1969.

The land in question is scattered across 19 counties in West Texas and was set aside for higher education by the state legislature in 1876 and 1886. It is controlled by the University's Board of Regents. Its oil and gas production has produced more than $1 billion in revenue for the University's permanent fund.

The surface, mostly rangeland, is leased to 130 livestock producers (lessees) who stock it with cattle, sheep, and goats. Lack of grazing management coupled with drought and other factors caused much of it to slowly deteriorate.

In 1969, Billy Carr, manager of University lands (surface interests); Dr. E. Don Walker, Chancellor; and the University's Board of Regents, decided to try to reverse this trend.

Before that time, oil and gas companies that leased mineral rights on the land paid lease and royalty payments to the University but surface damages for oil field activities were paid to the ranchers who leased the surface rights.

The 1969 decision changed that. First, damage money was paid to the University rather than the ranchers. The money was put in escrow and could be used by the lessee only to help carry out needed conservation work and related improvements.

Second, all lessees were told to contact SCS personnel assisting eleven local soil and water conservation districts in the 19 counties and to request assistance in working out a complete conservation plan on the unit. The rancher and the SCS conservationist would go over the land to determine the treatment needed. Two practices were required on all rangeland; proper grazing use and periodic deferred grazing. Lesses selected the final combination of measures to install and were allowed to use damage money to pay for brush control, range seeding, cross fencing, water development, corrals, or anything else needed to get conservation work applied to the land.

After each plan was completed, it was sent to Carr for review. If it met the needs of the surface and would result in grassland improvement, it was approved.

The livestock producer agreed to carry out the plan as a condition of the new lease. SCS agreed to provide the technical assistance needed to plan and install the conservation work and to go over each tract with the lessee at least once every year, review progress, help revise the plan if needed, make an annual status report, and then send it to Carr.

The author is with the Soil Conservation Service, Temple, Texas.

If the report indicated that the lessee was carrying out the plan, it was approved, but the failure to carry out the plan would result in termination of the lease unless quick action was taken to correct any deficiencies. Mr. Carr stated that the program has gone so smoothly since 1969 that opposition to the policy has vanished.

"We are extremely pleased with the way things have worked out, especially with the way SCS personnel have been able to show our lessees the value of grassland improvement measures. We have turned a lot of ranchers into conservationists. We have shown them that they can make more net profit by resting rangeland periodically," Carr said.

"But this could never have been done without the help and cooperation of the Soil Conservation Service," Carr continued. "We do not have the personnel to work one-to-one with our lessees but SCS does. The district conservationists and their staffs have been very patient working with our lessees, teaching and showing them the principles of range management. I can't say how much we appreciate it."

He said that some lessees who had never worked with SCS feared that the conservation policy would be too stringent. But these same ranchers are now very complimentary of the help they have received.

In 1977, Carr and the Board of Regents initiated a new flexible grazing policy. As the old five-year lease expires, the lessee is offered a new ten-year lease that is based on the price of livestock each year. When beef or lamb prices are down, the lease goes down. When prices go up, the lease goes up. The flexible grazing leases work as follows:

The rental price for cattle is based on the average price per hundred weight of 400 to 500-pound feeder calves with medium frame, and number two muscle at the San Angelo livestock auction. Prices are averaged from July 1 to October 31. That average price per hundred weight, less 30 percent, is the cost per animal unit per year grazing fee for one cow the following year. (One cow is one animal unit; one 500-pound steer is 0.5 animal unit.)

For example, if the average price paid for calves is $50 per hundred, the following year's lease will be $35 per animal unit. As a result, the per acre lease is higher on ranches with better land or higher rainfall than it is on shallow land in low rainfall areas. For 1980, the lease price for cattle was $59 per animal unit.

The price for sheep is based on 60 to 70-pound feeder lambs, grade good, July 1 to October 31, at San Angelo. Five sheep equal one animal unit. For 1980, the animal unit cost for sheep was $49. The animal unit price for goats is the same as sheep.

Leases are paid in advance semi-annually based on the number of animal units the producer plans to run. If this

number changes, an adjustment is made for the second six months.

The flexible grazing policy adopted in 1977 caused more opposition than the 1969 conservation policy, Carr said. This opposition, however, is not nearly as strong now as it was three years ago.

Carr has also worked out a new deer management policy on University lands designed to bring the buck:doe ratio to 1:1.

Here's how it works: Each fall Carr's assistant, Steven Hartmann, flies over each unit in a helicopter to make a deer census. If the buck:doe ratios are out of balance—and most of them are—the rancher is told to correct them with hunting pressure.

"We have several leases where there are ten times as many does as bucks," Hartmann stated. "That's because most people want to hunt bucks.

"But if you harvest one-fourth of your deer herd each year as wildlife biologists recommend, and you kill only bucks in a one-out-of-ten situation, you simply are not harvesting enough deer. The excess does over-browse the land, damaging the rangeland resources. Then when a bad winter hits, the deer die by the dozens. And that's a waste."

After the deer count, the lessee is required to pay the University a set price for the number of does and bucks Hartmann says ought to be harvested. Then the lessee is allowed to lease the land to hunters who are told what to harvest.

Any lessee who fails to harvest the specified number of does needed to get the herd into something close to a 1:1 ratio is in danger of having his lease canceled.

Hartmann says the policy is now so popular with ranchers that many are asking how they can get a census made on their ranches that they own.

A similar policy for harvesting dove and quail will be worked out soon.

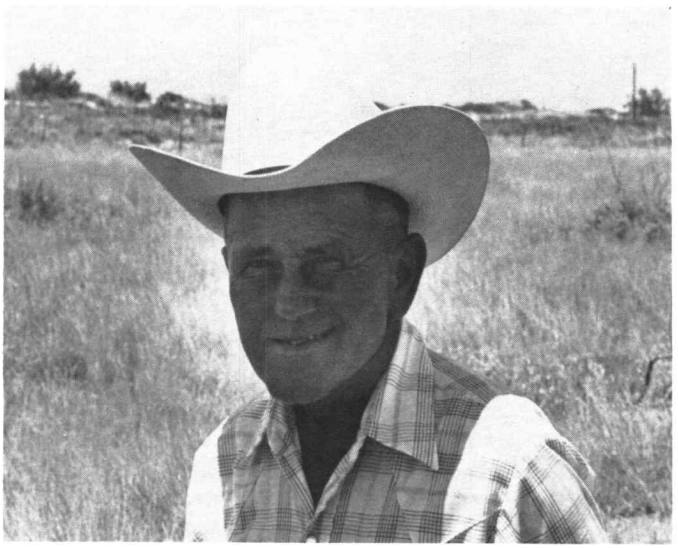
"But let me point out something," Carr stressed. "We could never have pulled off any of these policies without the full support of Dr. Walker and the Board of Regents. They have backed us all the way.

"Dr. Walker has told me several times that although we are now making money out of oil and gas, someday it will be gone. When that time comes, we will have to try to make our money out of the surface. That line of reasoning, and his continued support and encouragement, makes my job a lot easier."

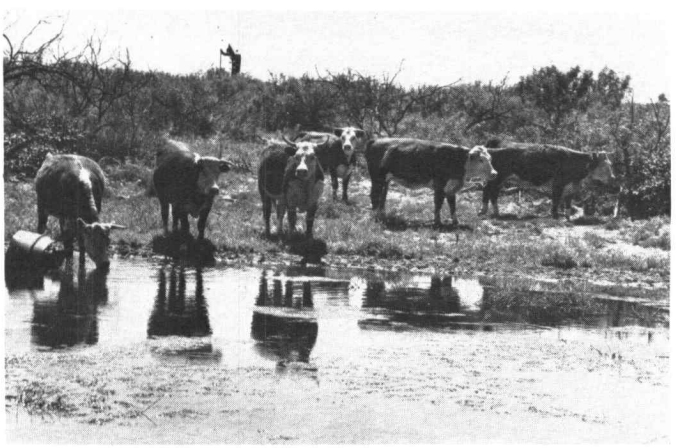
Billy Wyche, Jr. leases 26,650 acres from the University near Odessa in a 11-inch rainfall belt. Wyche doesn't own any land, but he takes care of his lease as if he owned it. In fact, he was named Outstanding Conservation Rancher of the Year in 1979 by the Andrews Soil and Water Conservation District and received an Excellence in Grazing Management Award from the Texas Section of the Society for Range Management in 1977.

I asked Wyche what he thought about being required to defer rangeland and carry out other needed conservation measures as a condition of leasing University lands.

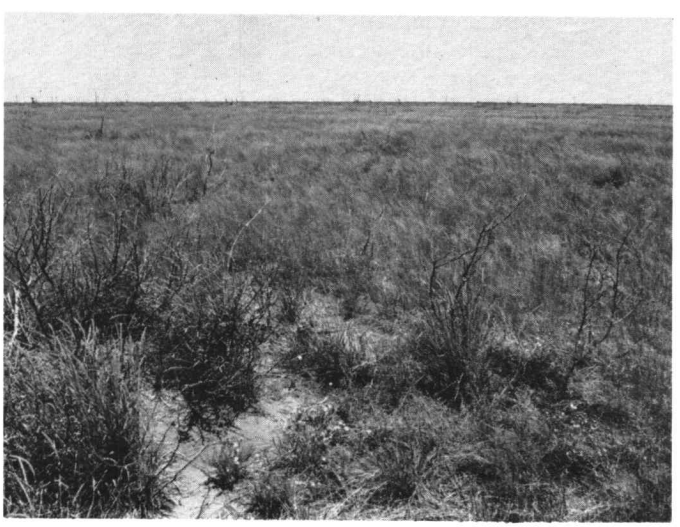
"I was looking for some way to improve the grass on this place when that policy went into effect," Wyche said. "I could see that the land was going downhill. My father first leased this ranch in 1932. I was working for him when I took the lease over in 1964. We had tried a three-month deferment, but it didn't seem to work out too well. The first time we used it, the pasture seemed to turn to grassburs.



Billy Wyche, Jr., carries out conservation work on a 26,650-acre tract of public land near Odessa he has leased from the University of Texas Board of Regents since 1964.



Wyche, who raises Hereford cattle, says that he never feeds hay; when he needs to feed hay, he sells cattle.



Wyche controlled these mesquites with a chemical spray. He rests the rangeland in a regularly planned sequence using a four-pasture, three-herd grazing system.

Through careful attention to grassland management, Wyche is gradually getting vegetation back on some once active sand dunes.

"When I started leasing the land, I tried some more 90-day deferments," Wyche continued. "But as soon as we turned the cattle back in, the grass would disappear almost overnight. Then I tried a six-month deferment, and it seemed to work a lot better."

Before Wyche's lease expired in 1970, he contacted SCS personnel at the Andrews Field Office and asked for help in working out a long-range conservation plan.

"I knew that Billy Carr was requiring at least a 90-day deferment on all rangeland every third year," Wyche said. "But I asked for a six-month deferment every fourth year. That's what we worked out and Billy approved it."

Joe Chapman, district conservationist for SCS at Andrews, said Wyche's deferment system is what range scientists call a basic four-pasture, three-herd planned grazing system. The ranch is divided into four large pastures and 11 small ones. About June 1, cattle are divided into three herds and placed in three large pastures; the fourth pasture is deferred until about December 1. Each year, a different large pasture is rested in rotation.

The smaller pastures are also deferred, but on a different schedule; they are grazed when needed to provide extra forage.

Wyche has made two complete rotations around the ranch and is now resting the second pasture in the third cycle. He has also used chemical sprays to control mesquite on some 2,600 acres of land and has used other brush management methods on wooly loco and shinoak. He said the grazing system and brush management work is showing good rangeland improvement and he is now feeding less during winter months than when he started it.

He is now stocking the ranch with Hereford cattle at the rate of 7.2 animal units per section.

I asked what he thought about the flexible grazing lease policy.

"My lease doesn't expire until 1984, so it's too early to tell how much my lease will go up," he replied. "But I'm afraid that if a man ranches by old standards, it will break him. We will no longer be able to afford the luxury of keeping dry cows or raising a bunch of late calves."

In other words, the premium will be on livestock management.

And livestock management, coupled with the use of sound range management principles, is steadily changing the looks of 2.1 million acres of public land in Texas. ●

Special Travel Arrangements for Calgary!!

The Society for Range Management and Western Airlines have made advance arrangements to accommodate as many members as possible desiring air transportation to our meeting in Calgary February 7–12.

Considering the limited air service and the restrictions on the discounted fares, we **strongly urge** you to make your travel arrangements as soon as possible. We have received a special toll-free number from Western Airlines for our members to call and arrange their air travel.

When calling this number *please:*

1. Identify your convention as *"Range Management";*
2. Indicate the *city* you are travelling from and the *desired dates* and times of travel;
3. Specify the form of ticketing—To be mailed, Travel agent, To be picked up at the airport, etc.

CONVENTION SERVICE NUMBERS: 800-227-6300 (except California)
800-632-2353 (California only)

In brief. . .

The Biology of Pastoral Man as a Factor in Conservation

(by L.H. Brown. 1971. Biol. Conserv. 3(2):93-100.)

The most serious threat facing natural vegetation and wildlife is the destruction of habitat by man. Millions of square miles of country in Africa have deteriorated to eroded wastes of bare soil or infested with unpalatable shrubs.

The purpose of this paper was to examine the way of life of pastoral tribes in Africa. These are persons who depend for subsistence mostly on the products of their stock: milk, meat, blood, and hides. This paper discusses (1) the basic relationship between the dietetic needs of pastoral people, (2) the number of stock they must keep to supply these needs, and (3) the production capacity of the environment.

The most important regular item of the diet of pastoral people is milk. This is the only constituent likely to be available in fairly regular amounts every day of the year. An average pastoral family in tropical Africa normally consists of about eight persons, half of whom are children. On the average, 20-24 Stand Stock Units (1 SSU=1,000 lb. live weight) are required for a minimum pastoral family standard of living.

When rising human population becomes too great to permit each family to maintain this necessary minimum herd, damage to the environment through overstocking becomes apparent. By competing for the available milk supply, the families starve the calves and depress the quality of their stock. To prevent this overgrazing situation required either the removal of humans or the alteration of their dietetic habits. Some possible methods of alleviating the situation include partial dependence on purchased grain or settlement on irrigation schemes. *(Summarized by Chuck Morris, Range Management, Graduate Student, Oklahoma State University.)*

Canada's Rangeland Resources—a Look Ahead

(by A. Johnston. 1972. J. Range Manage. 25:333-338.)

Canada's population is about 22 million and expected to rise to 28 million by the year 1980. Not only the population, but also disposable income and the per capita consumption of beef are also expected to rise by an appreciable amount. On the other hand demand for wheat will decline due to surpluses caused by advanced technology and decline of exportation to foreign countries. Dairy herds will be reduced because of declining milk consumption and increased production per cow.

Although Canada is a large country, out of the seven geographical regions almost all of the rangelands of Canada lie in only one region, the Prairie. In some of the other regions beef production could increase, but in many like the Arctic Tundra, there is not much hope for one reason or another for beef production to increase.

The vegetation of the Prairie Region includes mixed prairie, fescue grassland, and parkland. Two thirds of Canada's beef is located in this region. Forage crops expanded from 21 million acres in 1951 to 26 million acres in 1970, and all expansion occurred in this region. Again until 1973 forage crop acreage increased, in the same region, by 2 million acres. The total number of cattle in Canada is expected to rise from 13.7 million head (1971) to 16.5 million head by 1980. This increment requires a 5.3 million additional acres. Most of it is expected from Prairie Region because cattle provide the best alternative to wheat and feed grains. *(Summarized by T. Ghermazien, Agri. Engi., Graduate Student, Oklahoma State University.)*

Sheep Production on Seeded Legumes, Planted Shrubs and Dryland Grain in a Semiarid Region of Israel

(by E. Eyal, R.W. Benjamin, and N.H. Tadmore. 1975. J. Range Manage. 28:100-107).

The 200-400 mm rainfall belt in southern Israel—as in other regions bordering the desert—is a marginal cropping area. Grain and sheep are the main agricultural products in these areas. The objective of this study was to evaluate sheep and grain production with different stocking rates on grain, improved pastures (with legumes), and salt bushlands.

The experiment was conducted in the northern (semiarid) Negev of Israel. Ungrazed grain pastures produced 3.5 tons grain/ha. Stocking rates of 0.4-0.6 ha/ewe could be maintained on improved pastures without supplementation. Annual lamb yields ranged from 15-40 kg/ewe. Sheep performance on saltbushland was poor.

Saltbush could be used as a small portion of any annual pasture. Although of low palatability, it produces more hay per unit area than the fast-disintegrating standing hay or the herbaceous annuals. This aspect merits further investigation. *(Summarized by Mohammed R. Chaichi, Agronomy, Graduate Student, Oklahoma State University.)*

The Relationship of Furrow Depth to Moisture Content of Soil and to Seedling Establishment on a Range Soil

(by W.J. McGinnies. 1959. Agron. J. 51:13-14.)

Seeding arid rangeland is not always successful because inadequate moisture limits germination and retards early growth. Consequently, any practice which increases yields of grass on dry sites is highly valuable. The objective of this paper was to evaluate the effects of the furrow (1, 2, 3, and 4 in. deep and an unfurrowed check) on the reduction of the rate of water loss from that part of the soil in the bottom of the furrow in which the seed is planted.

For all treatments during drying cycles, the soil dried rapidly during the first 2 or 3 days and then dried at a much slower rate. The check and shallower furrows dried at a more rapid rate than the deeper furrows. However, from about the fourth day, all treatments lost moisture at about the same rate. There is apparently a minimum depth of furrow that must be achieved before the furrow has a significant effect on reducing moisture loss. Seedling data showed that a 4-inch furrow is required to give significant increase in seedling numbers. There are other aspects of deep furrow planting that must also be considered. In unstable soils, the soil may slough into the furrow and cover the seed too deeply. Generally, furrows can collect and hold water, fill with snow or ice and increase soil moisture under certain soil and climatic conditions. The method deserves careful examination for range seedings whenever soil moisture is a critical problem in establishing introduced grasses. *(Summarized by Enrique J. Sanchez, Range Nutrition, Graduate Student, Oklahoma State University.)*

Current Literature of Range Management

This section has the objective of alerting SRM members and other readers of *Rangelands* on the availability of new, useful literature being published on applied range management. Your recommendations on making this bibliography more useful are requested. Also, the compilers request readers to suggest literature items—and preferably also contribute individual copies—for including in this section in subsequent issues.

Aspen Community Types on the Bridger-Teton National Forest in Western Wyoming; by Andrew P. Youngblood and Walter F. Mueggler; 1981; USDA, For. Serv. Res. Paper INT-272; 34 p. (USFS, Intermtn. For. and Range Expt. Sta., Ogden, Utah 84401) Defines and describes 26 aspen community types in western Wyoming; includes a diagnostic key for community identification and discusses vegetation composition, environment, productivity, and successional status of each community.

A Computerized Bibliography of Selected Sagebrush Species (Genus *Artemisia*) in Western North America; by Roy O. Harniss, Stephen J. Harvey, and Robert B. Murray (Compilers); 1981; USDA, For. Serv. Gen. Tech. Rep. INT-102; 107 p. (USFS, Intermtn. For. and Range Expt. Sta., Ogden, Utah 84401) An unannotated bibliography of 1489 entries covering the period from the late 1800's to 1980; deals with plant ecology and management aspects of grazing, control, revegetation, wildlife, and watershed.

Coordinating Forestry and Elk Management; by L. Jack Lyon; 1980; Trans. N. Amer. Wildl. & Nat. Resources Conf. 45:278-287. (USDA, For. Serv., Intermtn. For. & Range Expt. Sta., Missoula, Mont. 59801) Provides recommendations for maintaining and enhancing elk habitat within timber management programs.

Cow-Calf Management Alternatives for the Texas Coastal Prairie; by M.M. Kothmann and G.M. Smith; 1981; Texas Ag. ic. Expt. Sta. Prog. Rep. 3773; 4 p. (Texas Agric. Expt. Sta., Texas A&M Univ., College Sta., Texas 77843) Based on information from a cooperating ranch and a production systems model, this publication evaluates management practices including different calving seasons, weaning dates, kinds and levels of winter supplement, and levels of nutrition for replacement heifers.

Deer in Arizona and New Mexico: Their Ecology and a Theory Explaining Recent Population Decreases; by Henry L. Short; 1979; USDA, For. Serv. Gen. Tech. Rep. RM-70; 25 p. (USFS, Rocky Mtn. For. and Range Expt. Sta., 240 W. Prospect St., Fort Collins, Colo. 80521) Utilizes computer simulations of the dynamics of southwestern deer herds to support low fawn recruitment rates and increased female mortality being the principal causes.

Deposition of Herbicides from Fixed-Wing Aircraft; by J.B. Grumbles, P.W. Jacoby, and W.G. Wright; 1980; Down to Earth 36(3):9-17. (Dow Chemical USA, Ste. 600, 12700 Park Central, Dallas, Tex.) A study of methods to increase target area deposition and reduce downwind movement of herbicides applied by low volume-low pressure techniques.

Description of the Ecoregions of the United States; by Robert G. Bailey (Comp.); 1980; USDA Misc. Pub. 1391; 77 p. (USDA, For. Serv., Washington, D.C. 20250) A classification system based on vegetation, soil, landform, and water; provides a description of each ecoregion including land-surface form, climate, vegetation, soils, and fauna.

Drought Effects on Cattle Performance, Diet Quality, and Intake; by M. Vavra and R. L. Phillips; 1980; Amer. Soc. Anim. Sci., West Sect. Proc. 31:157-160 (Eastern Ore. Agric. Res. Center, Union, Ore. 97883) A study located in the foothills of the Wallowa Mtns. in northeastern Oregon; compares results in a drought year with more average years.

Economic Data for Wildland Planning and Management in the Western United States: A Source Guide; by Eric Eisenman, Lee C. Wensel, Edward C. Thor, and Thomas W. Stuart; 1980; USDA, For. Serv. Gen. Tech. Rep. PSW-42; 125 p. (USFS, Pacific Southwest For. & Range Expt. Sta., P.O. Box 245, Berkeley, Calif. 94701) Lists economic data sources and descriptions by state governments, U.S. government, and private organizations; includes a subject guide (index); compiled for use by wildland managers and planners.

Effects of Fire on Flora: A State-of Knowledge Review; by James E. Lotan (Prog. Mgr.) et al; 1981; USDA, For. Serv. Gen. Tech. Rep. WO-16; 71 p. (Available from U.S. Forest Service, Washington, D.C. 20250 or U.S. Govt. Printing Office, Washington, D.C. 20402) Provides general description, autecology, synecology, fire characteristics, fire effects, and management implications and research needs of major flora types based on Kuchler's potential natural vegetation.

Effects of Sheep Grazing on a Riparian-Stream Environment; by William S. Platts; 1981; USDA, For. Serv. Res. Note INT-307; 6 p. (USFS, Intermtn. For. and Range Expt. Sta., Ogden, Utah 84401) A study of concentrated sheep grazing on stream and channel morphology in a meadow in central Idaho.

Effects of Stocking Rate on Sheep and Hill Pasture Performance; by S.H. Sharrow, W.C. Krueger, and F.O. Thetford, Jr.; 1981; J. Anim. Sci. 52(2):210-217. (Rangeland Resources Program, Ore. State Univ., Corvallis, Ore. 97331) Evaluated three stocking rates on improved hill pasture in the eastern foothills of the Pacific Coast Mountain Range in Oregon.

Environmental Quality and the Use of Herbicides on Artemisia/Grasslands of the U.S. Intermountain Area; by J.A. Young, R.A. Evans, and R.E. Eckert, Jr.; 1981; Agric. and Envir. 6:53-61. (USDA, SEA-AR, 920 Valley Road, Reno, Nev. 89512) Reviews the degradation of sagebrush/grasslands under domestic livestock and the technologies developed to counter this deterioration.

Forage and Herd Management to Reduce Risk in Cow-Calf Production; by Tesfaye Gebremeskel and C.R. Shumway; 1980; Texas Agric. Expt. Sta. Prog. Rep. 3633; 4 p. (Texas Agric. Expt. Sta., Texas A&M Univ., College Sta., Texas 77843) Evaluates the potential tradeoff between expected profit and variability in profits (risk) for an efficient cow-calf producer on the Texas Gulf Coast.

Growing Colorado Plants from Seed: A State of the Art. Volume 1: Shrubs; by Kimery C. Vories; 1981; USDA, For. Serv. Gen. Tech. Rep. INT-103; 80 p. (USFS, Intermtn. For. and Range Expt. Sta., Ogden, Utah 84401) Provides compiled information on germination and plant propagation of native and naturalized Colorado shrubs for use in reestablishing self-supporting ecosystems; 234 literature citations.

Guide to New Mexico Range Analysis; by Dave Bryant, Ed Le Viness, Phil Ogden, Lamar Smith, Kirk McDaniel, and Jerry Schickedanz; 1981; N. Mex. Range Impr. Task Force Rep. 7; 108 p. (Coop. Ext. Serv., New Mexico State Univ., Las Cruces, N. Mex 88003) Prepared to explain techniques and procedures utilized by federal agencies for analyzing New Mexico rangelands; intended for use on both public and private lands.

Herbicidal Control of Broom Snakeweed; by Ronald E. Sosebee, Donald J. Bedunah, Wayne Seipp, Gerald L. Thompson, and Robert Henard; 1981; Down to Earth 37(2):17-24. (Dept. of Range and Wildl. Mgt., Texas Tech Univ., Lubbock, Texas 79409) Compared the effectiveness of several herbicides for broom snakeweed control and the longevity of their effects, also their effects on forage production.

Improving Gulf Cordgrass Range; by C. Wayne Hanselka; 1981; Tex. Agric. Ext. Leaflet 1843; 4 p. (Agric. Ext. Serv., Texas A&M Univ.,

Compiled by John F. Vallentine, professor of range science, and members of the Range Club, Brigham Young University, Provo, Utah 84602.

College Sta., Texas 77843) Provides recommendations on the management and improvement, including burning, of gulf cordgrass range.

Market Values of Federal Grazing Permits in New Mexico; by John M. Fowler and James R. Gray; 1980; N. Mex. Range Impr. Task Force Rep. 2; 23 p. (Coop. Ext. Serv., N. Mex. State Univ., Las Cruces, N. Mex 88003) A Survey for New Mexico of (1) federal permit values of alternative proportions of public and private land in a ranch, (2) permit value changes since 1965, and (3) the determinants that affect the value of federal grazing permits.

Nutrient and Toxic Factors in Sweet Clover; by M.E. Benson, H.H. Casper, and L.J. Johnson; 1981; N. Dak. Farm Res. 38(6):6-8. (Agric. Expt. Sta., North Dakota State Univ., Fargo, N. Dak. 58102) A study to evaluate the nutritive value of sweet clover hay and assess the incidence and range of dicoumarol levels.

Nutritional Quality of Tobosagrass for Sheep as Affected by Sequential Burning; by J.E. Huston and D.N. Ueckert; 1980; Tex. Agric. Expt. Sta. Prog. Rep. 3716; 6 p. (Agric. Expt. Sta., Texas A&M Univ., College Sta., Texas 77843) A study of burning tobosagrass on staggered dates as a means increasing dietary protein content and energy digestibility of ingested forage.

Potting Media for Atriplex Production Under Greenhouse Conditions; by Robert B. Ferguson; 1980; USDA, For. Serv. Res. Note INT-301; 7 p. (USDA, Intermtn. For. and Range Expt. Sta., Ogden, Utah 84401) An evaluation of 39 potting media for container-grown saltbush in which soilless media was concluded as superior.

Relationships Between Fires and Winter Habitat of Deer in Idaho; by Jeffrey A. Keay and James M. Peek; 1980; J. Wildl. Mgt. 44(2):372-380. (College of Forestry, Wildlife, and Range Sci., Univ. of Ida., Moscow, Ida. 83843) A comparison of the response of white-tailed and mule deer to fire-induced vegetational changes in central Idaho mountains.

Roller and Wick Application of Picloram for Leafy Spurge Control; by Calvin G. Messersmith and Rodney G. Lym; 1981; Down to Earth 37(2):9-12. (Dept. of Agronomy, N. Dak. State Univ., Fargo, N. Dak. 58105) A study on the application of picloram by roller and wick applicators for the control of leafy spurge in pasture with reduced cost.

Water Repellent Soils: A State-of-the-Art; by Leonard F. DeBano; 1981; USDA, For. Serv. Gen. Tech. Rep. PSW-46; 21 p. (USDA, Pacific Southwest For. & Range Expt. Sta., P.O. Box 245, Berkeley, Calif. 94701) A summary on the nature and formation of water repellent soils, kinds of water repellent substances, effects on soil water movement, fire-induced soil-water repellency, and the management problems and implications of water repellency.

Legislative Log

The first session of the 96th U.S. Congress completed action on both the Budget reconciliation bill and the tax bill before adjourning at the end of July for the summer recess. The total amounts for the budget were reconciled in both houses but there are many compromises to be determined. Many natural resource agencies will have to wait for final details until Congress convenes on September 9. It appears that larger reductions in funds for natural resources agencies are proposed than was reported earlier. Personnel ceilings will result in a lesser work force for, in most instances, an increased work load.

The Reagan Administration is devoting considerable time to the overall minerals and oil fields. Considerable interest is being given oil and gas leasing. It appears that we will be hearing more and more on these subjects in the future.

Proposed Bill	Description of Bill	Status as of August 28, 1981
H.R. 2561 Congressman De La Garza, Texas	Commonly called Farm Bill 1981. Subtitle M-Rangeland Research includes a proposed cooperative rangeland research program similar to past proposals by SRM. It authorizes a $10 million appropriation for grants to land grant colleges and universities, state agricultural experiment stations, and to colleges and universities and federal laboratories having a demonstratable capacity in rangeland research. The proposed program calls for 50% matching by Federal and State monies.	Most of the staff work has been done on marking up the bill but there are still considerable differences in some commodity areas. Informed observers believe that most of September will be used to resolve differences. Action by both houses is expected soon after. Section M has been generally agreed to and there is no difficulty anticipated. Section M has active support from the National Cattlemen's Association and others.

There has been little action in legislation in the natural resources field during June and July. It is expected that after Congress convenes on September 8th that action will occur on many bills which we will report in future issues.

President's Notes

Many, many thanks to Russ Lorenz, Jim Kramer, Jim Carr and their North Dakota compatriots for all the hard work and warm hospitality that made the summer meeting in Bismarck a most pleasant and productive time. Their enthusiastic effort and outstanding results typify the thousands of volunteer hours and countless personal dollars invested by individual SRM members each year in the life of our Society and furthering our profession. We can take justifiable pride in the prevailing attitude and resulting accomplishments.

That same spirit has the Canadian crew working overtime to assure that the annual meeting in Calgary will be one you won't want to miss. Many SRM members have been planning and saving for months to be there for sure.

Two of our most necessary and treasured opportunities are at hand. One is to vote on the extremely well-qualified list of candidates submitted by the Nominating Committee for your consideration as future leaders of SRM. The other is to renew your own membership promptly after considering family, sustaining, and life memberships as helpful options and to use the new membership application form you recently received to recruit at least one new SRM member. Additional forms are readily available on request.

Membership is the lifeblood of the Society both in terms of revenue and impact. While Society and Section officers and membership Committees can provide leadership and assistance, each SRM member is the most vital link in recruitment and retention by the example of enthusiasm and effectiveness you reflect in your daily work and in your relationship with SRM and by your eagerness to share SRM with others who should be members. Do yourself and your friends a favor by inviting them to join with us. When I have asked several people why they were not SRM members, the reply was "No one ever asked me." I did, and they did.

A change in job assignment for Doug Sellars has reduced the effort he can invest in membership committee activities. Joe Norris has agreed to become chairman of the SRM Membership Committee and to lead an intensified effort in recruitment and retention. Doug will continue as a member of the committee working on some special projects in member services.

Student membership and participation is a continuing major priority for the Society and Sections. How many of you first became aware of SRM and joined as a student? Many activities can and do begin at high school age or even before with 4-H and FFA, range plant identification, and range judging contests and especially in the youth range camps operated very successfully by several Sections that afford in-depth knowledge and lifelong interest in range. Scouting activities afford tremendous potential for broadening awareness and appreciation for range.

At the college level each of these opportunities is magnified, and lifelong professionalism emerges. Intensive career preparation leads to concern for employment that will serve the resource, others, and self in varying order.

The SRM Student Affairs and Employment Affairs committees in cooperation with Section youth committees and chapters yearlong to plan and carry out the Youth Range Forum, Student Conclave, judging contests, and other professional and social activities that will encourage participation and preparation for one of the most satisfying careers or avocations. What better investment could we as a Society make for the future of the resource and the profession? Keep up the good work.

And a word directly to our student members. I hope you can easily see the concern and high regard that the regular members hold for your present and future in our individual and collective attitudes and actions. Please help us evaluate how well our current activities meet your needs and desires. Please suggest any innovations that would improve our student services. We are pleased and proud to have our student members as a strong presence and a stronger future for SRM.—**John Merrill,** President, SRM

Notes from Denver

Summer Meeting—Successful!

The 1981 Summer meeting planning team really did a super fine job of preparing for the Summer Meeting in Bismarck. Every detail was planned meticulously, the accommodations and facilities were excellent, the field trip was informative and on schedule, the banquet was entertaining, and a lot of work was accomplished. The *Budget Committee,* chaired by *Jack Bohning,* labored valiantly for 10-12 hours revising the 1981 budget and reviewing and amending the 1982 budget. The Board of Directors met for two and one-half days on Society business affairs, activities, and SRM Committee reports. You will find a brief summary of actions taken by the Board, published elsewhere in this issue.

Recruiting for Editor, *JRM*

Rex Pieper has requested that he be relieved of the job as Editor, *JRM*, effective at the time of the Calgary meeting. Elsewhere in this issue of *Rangelands* is a vacancy announcement. Questions about the position can be directed to this office if additional information is required.

2nd International Rangeland Congress

The Congress will be held in Adelaide, South Australia, May 14-18, 1984, with pre- and post-Congress tours. SRM has offered the full services of the Society in supporting the Australian Rangeland Society, host for the Congress, in publicity and promotion for the Congress. Our journals, mailing services, and Annual Meetings will be utilized to keep you informed about the Congress.

Dr. Victor Squires, Chairman of the Planning Team for the Congress, spent several hours in the Denver office discussing our cooperative arrangements with the Australian Rangeland Society and the 2nd IRC.

Accreditation

The Range Management program at *Texas Tech*

University has been accredited by the Board of Directors at the Summer Meeting. This is the fourth University to receive accreditation from the Board of Directors based on recommendations from the *Committee on Accreditation* chaired by *Phil Sims*. Accreditation is a lengthy, meticulous process beginning with the preparation of a self-evaluation report by university faculty; careful review by the Committee on Accreditation followed by hours of discussion; review of campus facilities and interviews with students, faculty, administrators, and employers by a campus visitation team; further hours of review of this report and additional committee discussions; and a recommendation to the Board of Directors who make the decision on accreditation.

Washington State University has completed all the requirements; the campus of New Mexico State University will be visited in November.

Memorial

This office was saddened to learn of the recent deaths of two long-time faithful members of the Society: *Avon Denham* and *George Van Dyne*. The Society has an *Endowment Fund* to which contributions can be made in memory of these friends and fellow members.

A Correction

The June *Rangelands* "Notes from Denver" informed you of our Memorandum of Understanding with the Forest Service to develop a computer based information system. The article stated that "—the project is supported financially by the Forest Service." Actually, it is an inter-agency effort supported financially by the Forest Service, Soil Conservation Service, and Bureau of Land Management. My apologies to these other agencies.—**Floyd E. Kinsinger,** Executive Secretary SRM.

Summary of the Minutes of the Meeting of the Board of Directors

Following is a brief description of actions taken by the Board of Directors (BOD) at the Summer Meeting in Bismarck, July 20 - 24, 1981. These minutes have not been reviewed by the BOD and are subject to correction. The minutes are *unofficial* and *unapproved*.

Copies of the minutes will be sent to all Section Presidents and Presidents-Elect, all Committee Chairpersons and the President and President-Elect of the Advisory Council. Any member of the Society may obtain, at cost, a copy of the official minutes of meetings of the BOD by contacting the Denver office.

1. Accepted candidates for Honor Awards.
2. Approved revisions to Honor Awards Handbook.
3. Accepted slate of officer candidates presented by the Nominating Committee.
4. Approved procedures to include bio-data of office candidates with ballot and publish it later in December *Rangelands* for historical purposes.
5. Approved revisions to the Nominations Committee Handbook.
6. Approved minutes of the meetings of the BOD at Tulsa.
7. 1981 budget was approved subject to continued monitoring and revision as necessary.
8. Established an endowment fund.
9. Accepted the report of RISC, including the working definitions for rangeland terms.
10. Accepted recommendations of the Advisory Council including:
    a. Labels for delinquent members will be sent to Section Presidents for member retention.
    b. Articles be solicited for *Rangelands* on internship programs.
    c. Definitions of terms proposed by RISC be accepted as "working" definitions" subject to further review.
    d. Policy formulation procedures as edited.
    e. President to contact agency heads concerning attendance of personnel at Calgary.
    f. Adoption of planning process as proposed by the Planning Committee; membership of the Planning Committee to be composed of past officers.
    g. Approval of the resolution on Grazing Lands Coordinating Council.
    h. Support of the "Grazing Lands and People" project.
11. Discussed Handbook of the Affiliations (Liaison) Committee and requested it be published as amended.
12. Approved expansion of the Affiliations Committee in membership and affiliated societies.
13. Approved an I&E brochure prepared by the I&E Committee.
14. Approved a "brag sheet" prepared by I&E.
15. Approved $300 for FFA booth and expenses.
16. Decided to send OWRC films to NACD library and the Forest Service for distribution, once the legal ownership of the films is transferred to SRM.
17. Requested that information be sent immediately to all members about the Calgary meeting and program, including a membership brochure and a letter from the President about membership.
18. Approved a draft Annual Meeting Handbook.
19. Provided full support of SRM to the 2nd International Rangeland Congress.
20. Supported the resolution on formation of a Grazing Lands Coordinating Council.
21. Supported the Grazing Lands and People project.
22. Approved recommendations of the Advisory Council (see item 10).
23. Approved amended policy formulation procedures.
24. Approved planning process.
25. Denied cost-of-living (COL) increases for Denver staff for 1981 and COL and merit increases for 1982, pending further review of the budget at the next BOD meeting.
26. Adopted 1982 proposed budget.
27. Requested costs of servicing each member.
28. Decided not to join the Federated Societies of Agricultural Science.
29. Approved appointment of an ad hoc committee to advise the BOD on promoting international activities.
30. Approved accreditation for Texas Tech University.
31. Agreed to a second meeting with other societies concerning cooperative accreditations efforts and member-

ship on the Council for Postsecondary Accreditation (COPA).

32. Agreed to a questionnaire for soliciting membership reactions and suggestions.

Speak Out Space

To the Editor:

While the observance of National Agriculture Day on March 19, 1981, probably didn't have the impact on most of us that Memorial Day or Fourth of July has, I hope it did provoke some pertinent thoughts concerning the present condition and status of agriculture in America today.

Americans directly involved in agricultural production constitute about 3 percent of our United States population of over 225 million people. This 3 percent of the population feeds the people of this country for an unbelievable 13.6 percent of their income—by far the lowest in the world; but let's stop a minute and analyze the direction of American agriculture and what is influencing this direction.

As we heard at the SRM annual convention in Tulsa, the agricultural debt in this country increased 340% in the 1970's. While we can only surmise, a good guess as to "why" could be the exorbitant prices paid for agricultural land. While these ridiculous prices are influenced by many factors, one very large factor has to be *encouragement from the federal government,* which we all hope will be stopped very shortly. While the intent of many of these federal programs may be positive, their effect is drastically negative.

Federally subsidized loans encourage the purchase of rangeland at farmland prices. This land is often plowed and seeded and the purchaser tries to make payments by producing grain, even though the soil does not have the capability of producing a profitable crop; not to mention the risk of trying to farm even the best of soils in a 12-14 inch rainfall belt.

The next thing to occur is the federal government back on the scene with disaster payments to rescue the "poor farmer" whom they encouraged to plow land that should never have been farmed. These disaster payments do nothing more than further encourage poor management and failure. Why try to be good land stewards or managers if we can get paid to be poor land stewards or managers?

This entire cycle, of course, only augments our already uncontrollable inflation. We can talk all we want to about modern farming techniques and better machinery than in the past, but the fact is that Class VI land[1] in a 12-14 inch rainfall belt cannot be profitably farmed on a long-term basis!

It would probably not be unreasonable to assume that the Federal government will soon realize this and come forth with a litany of land use regulations. These regulations will be an attempt to stop many of the practices which government has been encouraging and subsidizing for years, and the "poor farmers" whom they have been helping will become tenants on land controlled by the government.

While this idea is possibly a little far-fetched, look what has happened in Russia during this century. We were told at our annual Society for Range Management meeting in Tulsa that in 1918 Russia was the world's largest exporter of agricultural products. Now, she can feed neither her own livestock nor people.

It is not too late to reverse this trend. Just think a little before you pay too much for land or drop that plow into the ground. We in agriculture have a heritage to be proud of and to build upon, as well as being charged with a tremendous responsibility to meet.

I hope these dry years, that much of our Great Plains area have been experiencing, have made us more aware of the long-range productive capability of the land in our area and that we have learned to manage it accordingly.

Just keep one thought in mind at all time: *Land is not something we have inherited from our forefathers, but something we are borrowing from our children.*—**David A. Fischbach,** Rancher, Faith, S.D.

To the Editor:

Rangeland management has been in various phases of neglect, development, favor and disfavor, but over a period of time the total program is on a gigantic treadmill. It doesn't solve its problems; progress isn't great. For example: Who is going to manage public rangelands? This issue has been debated for 100 years and is still with us. Another example: In 1935 and again in 1976 rangeland assessments say that productivity can be at least doubled (Senate Document 199 in 1936 and Resource Planning Act, 1980). Another unsolved problem is wild horses.

Rangelands have been improved in some areas, but generally over *all* of the rangelands what is the improvement record? Does anyone really doubt that productivity can be doubled at least? What has prevented the improvement of rangelands? All rangeland interests would be benefitted by improvement. Has lack of unity and in-fighting caused management by legislation and court order? Can either the courts or Congress be more professional or be specific enough to prescribe the treatments for a single area of land let alone *all* of the rangelands?

Range managers have not solved their problems. For example: They failed to listen or take seriously what wild horse supporters were saying in the 1960's. These advocates found a way around indifference. In their zeal a law was unanimously passed in 1971 but it has been amended twice and it still needs improvement. There have been constant and continuous court cases and these are not over. Offended people have recourse; they pass laws and go to courts but neither are final solutions.

Is it possible to resolve differences such as: what is range condition, accurate inventory methods, how to compute and express allocation alternatives, seasons of use, grazing intensities, monitoring methods, key species, key areas and others? Is it possible to speak a common language? (A definition of range condition was legislated, but it is really two conflicting definitions.) If corrections are not made, in the next 20 years rangelands will still be producing well below their potential just as they are today.

What are solutions? Consider the following: The atmosphere concerning rangelands must change. Rangelands are not wastelands. Rangelands are not good-for-nothings; they are priceless. Education is a useful tool for changes over time. For rapid change, scare tactics have worked. Could a scare program be used? Users, visitors and publics are better informed now than during the halogeton scare days. Known manipulated scare programs would be dishonest. A program

[1]Soil-mapping units form the basis for the land capability classification system. Arable and non-arable soils are separated according to their potentialities and limitations. Limitations in use or risk of damage become progressively greater from Class I to Class VIII. Soils in Class VI have severe limitations that make them generally unsuited for cultivation and limit their use to pasture or range, woodland, or wildlife food and cover.

could be based on a food shortage but it would be perceived as single interest oriented and all interests need to champion this program. A shortage of oxygen could be used to create the concern for the health of rangeland plants because the carbon dioxide content of our atmosphere is increasing but the small amounts of oxygen generated by range plants in comparison with the algae and other plants of the seas make this approach doubtful.

What can work? Consider working together within the range management profession and a straight forward no nonsense economic assessment. Many areas can be improved with little added investment. In New Mexico the production increased three times with the change from year-long grazing use to dormant season only use and it happened in less than 15 years. Production doubled in 8 years. Think that's an exceptional case? Many areas could double in production with a little tender loving care. What is the potential of a site which has only sagebrush, or greasewood, or cheatgrass or 99% mesquite?

Each action must be cost effective so all the costs and benefits must be captured and quantified. Getting all of the benefits has been the problem but capturing all benefits is vital for cost evaluations and to generate support from all interest groups.

The benefit data should consider elements like: The total benefits of a healthy rangeland in quantifiable terms (dollars), the value of the top ¼-inch of soil, the long term productivity with and without that top ¼-inch if it should be lost, the present and potential productivity of each site, the species and numbers of animals now and with various treatments, affects on soil organisms, infiltration rates, and economics to society and to users. Where are these kind of data? Most studies are on small plots. These were necessary to control the number of variables and because of costs, but extrapolating from those data to the real thing has been difficult. The Saval Range Project in Nevada was started with the intent of providing information of this kind. These data are essential for credibility with the professionals, education and demonstration of publics and building the needed unity.

The Saval is a research and evaluation program. It is a comprehensive examination of a working ranch trying to get at total values. The study will look for the best range practices and their effects on streams, birds, deer, etc. and whether or not they are in concert with each other and the total ranch operation, economics, workload, etc. The total comprehensive impacts have been needed for a long time and here is the opportunity to do it—and see what effects are totally. The ranch is a working ranch containing 48,000 acres of privately owned land, National Forest land and land administered by the Bureau of Land Management. It is land typical of thousands of acres of rangeland in the Intermountain West and is an ideal laboratory for field studies.

What are the rangeland assets, liabilities, operating costs, investment possibilities, expected returns on investments? The stockholders deserve to know. The practioners must supply the details. Is the range management profession so tenuous that the stockholders can not be convinced that remodeling will result in more returns, better tenants, and improved relations with those tenants? Range management must have its professional armed with facts and a demonstratable pay off, if it is to survive!—**R. Keith Miller**

Excerpts from the Editor's mail:

I thought the two Sagebrush Rebellion articles were very well done (October 1980). I think *Rangelands* publication is excellent and is well written for the purpose.

Lee Sharp
Idaho

It is a pleasure to know that a special historical issue will come out in June. I am convinced that an occasional number on this subject will be of particular interest and value.

Lee Burcham
California

I was impressed with the entire April 1981 issue. It was very international in flavor. I have written to one of the authors for more information.

Ray Anderson
Arizona

Thank you for a copy of the special historical issue of *Rangelands* (June 1981). Our family was most pleased with the inclusion of my father's 1962 article. The photo of him came out quite well. I am sure he would have been delighted to be included. I also noted the picture of the first Advisory Board—the same picture still hangs over dad's desk at the ranch.

Willis Carpenter
Colorado

I thoroughly enjoyed the June 1981 issue, especially the article by Ferry Carpenter.

Barbara Lemont
Florida

I was glad to see the old 1936 Grazing Service Advisory Board picture. Many of these men gave generously of their time and knowledge to helping the Grazing Districts get set up. They deserve recognition.

Marion Clawson
Maryland

Your efforts in preserving old photographs and other livestock history are greatly appreciated.

James Jacobs
Utah

I like the nontechnical articles in *Rangelands*, balanced with Society business, and I am glad the Society recognizes the need for a nontechnical publication to complement the *Journal of Range Management.*

A.P. Atkins
Oklahoma

Congratulations on your excellent job with *Rangelands.* I enjoy it very much but would like to see more articles outside the United States. So I am sending you one from Greece.

V.P. Papanastasis
Greece

Rangelands for June is here and it is still June! It is a very good issue.

Mel Morris
Montana

Congratulations on the June 1981 issue of *Rangelands*. It is an extremely interesting and informative publication. I enjoy all issues of *Rangelands*, but this one is extraordinary.

Don Pendleton
Washington, D.C.

Keep up the good work. I look forward to reading through *Rangelands* each issue.

John Mitchell
Colorado

Membership Update

Status—Memberships continue to come into the Denver SRM office. The total membership is now over 4900. This is up over 800 from December 31, 1980. December 31 is the "drop date" for nonpayment of dues. We realize folks are accustomed to a three-month carry over into the coming year. The December date, however, allows for better fiscal accounting and more accurate status reports at the winter meeting each year.

New Membership Brochure—The Denver office staff reports lots of requests for this new full-color brochure. It says most of what you need to say for recruitment and can be quickly read. At President John Merrill's request, the Membership and I&E committees drafted this brochure at the Tulsa meeting. The Denver SRM staff helped with photos, layout, and printing—all in a short time frame. We are proud of it but hope to improve it. Those who have better colored pictures and suggestions should send them to Joe Norris, Box 2466, Abilene, Texas 79604.

New Help—Joe Norris has agreed to help us out on the membership committee. Joe is going to take the reins and free me up to work more on our committee projects. I appreciate his help; besides, he is still owing me some from our last horse trade. You will be feeling the heat of his enthusiasm.

Membership Card—Score another success for the Membership Committee. Membership cards, approved at the Tulsa-81 meeting, will be issued next time you pay your dues. Each card will be numbered with your membership number. Besides showing your SRM membership, the card will enable you to receive certain benefits. Example: Avis Rental Car has agreed to give discounts to card carrying SRM members. Other similar benefits are being negotiated. Members paying their dues by December 31 each year will get their numbers entered into special drawings for some unique prizes. These will be discussed in future issues of *Rangelands.*

Section Goals—How does your Section stand on its 1981 membership goals? At the Tulsa-1981 meeting, goals for recovery of dropped members and recruitment of new members were assigned to each Section. Please check with your Section officers to see where your Section stands on its goals.

Thanks, President John Merrill—Thanks for your recent letter to the membership. I hope each one accepts your invitation to use the new color brochure and recruit a member.

Thanks Denver SRM Staff—We have a good staff in the Denver Office of SRM. They have responded quickly to my requests and are really supporting membership committee efforts—**Doug Sellars,** Membership Committee

Membership Report

This year is over half gone. Membership in SRM is just about holding its own. No real significant gains have been made as we had hoped.

Unless you are directly involved in a membership drive, it is hard to become devoutly interested. Just about any distraction will take your mind away from the importance of individual concern to increase membership. When you read this plea, ask yourself, "Has my spouse signed up for his or her membership?" We could sure increase our numbers in a hurry if you stopped to think of the advantages of paying membership dues for your spouse—especially if you think ahead to tax time around January 1.—**J. Norris.**

Membership Report
July 30, 1981

Section	Regular	Student	Regular Sustng	Emeritus	Inst.	Family	Life	Life Sustng	Total
Arizona	214	39	6	13			9	7	288
California	224	88	10	6		1	19	9	357
Colorado	246	70	2	6		1	29	9	363
Idaho	183	32	5	5		2	10	3	240
Kansas-Oklahoma	151	27	4	9	1		10	1	203
Mexico	49	23	2	1			6		81
Nebraska	79	32	2	4			5	1	123
Nevada	123	18	4	2		1	6	2	156
New Mexico	180	63	4	10	1	2	11	4	275
Northern Great Plains	213	32	19	7			13	6	290
International Mtn.	229	51	9	5		1	18	7	320
Pacific Northwest	359	74	12	19		1	32	9	506
South Dakota	98	14	1	5			15	2	135
Southern	68	12	1	5			9	2	98
Florida	48	8	2				1	1	60
Texas	420	154	13	7		3	20	6	623
Utah	179	62	8	8		3	15	2	277
Wyoming	167	59	4	2			13	3	248
National Capital	75	1	5	3			4	4	92
North Central	39	8	1	1			4	1	54
Unsectioned	111	9	3				5	1	129
Total	3,455	876	117	118	2	16	254	80	4,918

SOCIETY FOR RANGE MANAGEMENT
Comparative Operating Statement to Budget
July 31, 1981

Income item	Actual income	Budget	Expense item	Actual expense	Budget
1. Membership	$61,800.42	$180,673	1. Payroll	$57,769.56	$ 96,872
2. Subscriptions	30,605.95	46,000	2. Payroll taxes	3,985.88	6,780
3. Advertising	1,925.64	2,500	3. Employee insurance	715.06	1,200
4. Page charges	14,662.90	18,000	4. Dues & subscriptions	602.25	400
5. Jewelry	167.13	325	5. Interest	5,877.51	10,500
6. Publications	6,048.65	20,000	6. Postage & handling	13,082.99	15,000
7. Interest	8,195.64	1,100	7. Stationery & supplies	7,255.77	8,000
8. Annual meeting	24,685.90	18,000	8. Travel	4,115.00	10,000
9. Accreditation	7,528.35	1,500	9. Telephone	1,684.40	5,000
10. Donations	985.36	3,000	10. Equip. maintenance	2,383.19	3,600
11. Certification	5,513.34	500	11. Legal & accounting	200.00	750
12. Overhead	136.71	200	12. Monetary exchange	39.37	1,000
13. Miscellaneous	00.00	500	13. Printing	53,431.25	63,400
14. Employment service	205.00	00.00	14. Jewelry	748.50	500
15. Reprints	6,354.40	00.00	15. Awards & displays	2,116.16	1,000
16. Postage	157.50	00.00	16. Annual meeting	3,418.18	5,000
17. Contract Services	2,371.25	00.00	17. Equipment lease	7,048.26	12,000
18. Section	1,296.42	$00.00	18. Building insurance	00.00	1,100
	$172,640.56	$ 292.298	19. Repairs & maint.	1,097.78	2,500
Assets: trust accounts			20. Utilities	2,282.00	3,200
1. Life membership		4,000	21. Property & other tax	3,453.71	4,000
2. Building lease	8,089.75	14,100	22. Accreditation	4,179.01	00
3. Building blocks		200	23. Certification	00.00	200
			24. Miscellaneous	5,761.92	9,700
		$ 18,300	25. Committee expense	1,221.70	3,000
			26. Contract Services	10,176.49	
			27. Washington Office	86.59	00.00
			28. Sections	1,088.70	00.00
				$193,821.23	$264,702
			Capital Investments		
			1. Typesetter	2,333.31	4,000
			2. Building (principle)	3,782.06	5,304
Totals	†$180,730.31	$310,598		†$199,936.60	$274,006

†Note: This is the traditional time (June, July, and August) when Society expenses exceed income. Historically, the Society has had to borrow money during this time but, fortunately, the Society has not had to borrow money either in 1980 or 1981. This comparative statement shows actual income and expenses for 1981—since January 1. Considerable dues and subscription income for 1981 was received in 1980 and, therefore, does not show on this statement as income for 1981. Seventy-five thousand dollars of this money was invested in CD's which have been cashed at maturity and used to pay 1981 expenses. Current liquid assests show about $40,000 in the checking account, and approximately $60,000 in savings and trust accounts.

Inter-nation Range Workshop, August 2—7

Professional range managers from the United States and Mexico met in August for the first in a series of workshops planned as part of a bilateral cooperative effort to protect and develop the arid zone common to both countries.

Planning for the workshop began at a Department of State-sponsored US-Mexico meeting on agriculture, new crops, and arid lands in September, 1979, at Saltillo.

Significant agenda items in the 1979 meeting included joint efforts regarding (1) commercialization of native plants, (2) development of respective national plans to combat desertification, (3) monitoring and evaluating of desertification, and (4) a series of resource related workshops. Mr. George Lea, Bureau of Land Management, was designated as responsible for initiating arrangements on behalf of the U S. for a Range Management Workshop. Mr. Lea subsequently asked the Society for Range Management, through the International Affairs Committee, to sponsor the Range Management Workshop, select a meeting site, develop the agenda, contact speakers, and make other necessary arrangements.

The following individuals were selected to develop the Workshop:

United States: Joseph L. Schuster, Texas A&M and Robert L. Schultz, BLM, cochairmen of the US Planning Team; Carlton Herbel, ARS; Arnold Nelson, New Mexico State University; Phil Ogden, University of Arizona; and Lorenz Bredemeier, Society for Range Management, International Affairs Committee.

Mexico: Martin Gonzalez, INIP-SARH, chairman of the Mexico Planning Team; Armando Lodigeani, DADC-

CONACYT; Enrique Sanchez, INIP-SARH; Luis Carlos Fierro, INIP-SARH; Gorge Galo Medina, UAAN-Saltillo; and Guillermo Nova, ITESM, Monterrey.

The purpose of the workshop was to develop specific recommendations for bilateral cooperative demonstrations and research projects in range management to foster joint efforts in anti-desertification and arid land development. The published proceedings will contain recommendations for jointly sponsored projects for follow-up by the U.S. and Mexico in their efforts toward arid land development and desertification suppression. Such efforts will enhance bilateral exchange of technology and commerce to the benefit of both countries.

The Workshop began on Monday August 3, in Chihuahua, Mexico, with a discussion of the current programs in range management and Mexico. Speakers included government agency personnel, university faculty, administrators, and research workers from both countries.

Tuesday was devoted to discussions of state-of-the-art and possibilities for U.S.—Mexico cooperation in range management technology transfer. President John Merrill, SRM, moderated this session which included a thought-provoking presentation by John Pino of The Rockefeller Foundation of the required process for technology transfer from the acquisition of knowledge to its confirmation and demonstration "on the farm."

The workshop group traveled by van and auto to the Ranch on Experimental La Compana for lunch hosted by the La Campana staff. Discussions were held concerning the research activities at La Campana. Delegates were able to tour and observe the facilities and field plots, and observe experimental animals. Delegates continued by van and auto to Las Cruces, New Mexico.

The Jornada Experimental Range and College Ranch of New Mexico State University were toured on Wednesday morning. Research staff and faculty discussed plant and animal projects, grazing trials, brush control, watershed hydrology, and numerous other research and demonstration efforts.

Wednesday afternoon sessions included a continuation of discussions on technology transfer. On Thursday and Friday, delegates were divided into three Range Management Workshop groups: (1) plant materials, (2) range rehabilitation, and (3) grazing management and requested to develop specific recommendations for cooperative U S —Mexico research and demonstration projects. Recommendations from each workshop group were discussed in open forum on Friday morning.

It is stimulating and inspiring to see the dedication of professional range managers, regardless of their country of origin, and the eagerness and their willingness to work together across national boundaries for the common good of rangeland resources and users.

Proceedings of the Range Management Workshop will be published soon. Recommendations resulting from the workshop will be presented to government authorities in both countries for support to carry out these recommendations.—**F. Kinsinger.**

Kansas Range Youth Camp

Fifty-two young men and women throughout Kansas participated in the 21st Annual Kansas Range Youth Camp at Rock Springs. The event, sponsored by the Kansas-Oklahoma section of the Society for Range Management, provides training in the art and science of range management. More specifically, training is focused toward the 16½ million acres of Kansas rangeland through a selected group of young men and women sponsored by Kansas Conservation Districts. Campers are encouraged to take their training back to their local communities to foster improved range management.

The importance of range plants and their identification is the most stressed topic of the camp. Campers learned to identify many of the major grasses and forbs which compose the range ecosystem through a series of field trips and the study of various plant characteristics.

An introduction was made to range ecology, soils, range sites, range conditions, and plant structure on the first day of camp. Additional subjects included stocking rates, livestock distribution, grazing management, supplemental pastures, and a program on wildlife management.

Highlights at this year's camp were a presentation by Bill Roper, rancher from Soldier, Kansas, and a tour of the Sunrock Ranch, owned by Elaine Harder, near Rock Springs.

On the ranch tour the campers were exposed to range management in practice. Elaine showed the group various range management principles in operation, differences in range sites and vegetation, and the effects of livestock grazing. Bill spoke to the group through a slide presentation of his ranch of 3,700 acres in Jackson County. He pointed out

Photo by Paul Ohlenbusch

Art Armbrust, president of the Kansas-Oklahoma Section, Society for Range Management, (left back) is with the outstanding campers from the Kansas Range Youth Camp. Frank Kathrens, Jr., Nemaha County, (center back) was chosen outstanding camper by fellow campers. Winning individuals honored in the plant identification contest were: high individual Mark Jirak, Marion County, (front, left); tied for second, Roberta Shidler, Cherokee County (center front) and Deane Lehmann, Logan County (right front); and fourth place by Kevin Ericson, Bourbon County. The Range Youth Camp is an annual function of the Section.

the importance of proper range management in his and every operation. Campers also received updated information on beef cattle management and prescribed burning.

Art Ambrust, president, of the Kansas-Oklahoma Section for the Society of Range Management was on hand to recognize the plant identification contest winners and to re-emphasize the need to develop an understanding of range ecosystems in order to provide for the wise and proper use of our nation's rangelands. All five winners received a copy of the book *Pasture and Range Plants*, donated by Phillips Petroleum Company.

Next year's camp is scheduled for July 14–17. This camp is open to one or two young men or women from each county in Kansas who will be juniors or seniors in high school and who are interested in range management.—**Jeff Hart**

Department Head: The Department of Range Science at Colorado State University invites applications and nominations for the position of department head. The Department has extensive teaching and research programs in range science and related disciplines. Eleven full-time faculty members are involved in undergraduate and graduate teaching, research, and extension. The candidate should have strong interest and/or experience in administration, undergraduate, and graduate teaching, basic and applied research and public service. A doctoral degree in range science or related field is required. Send letter of application and resumé to Dr. Donald A. Jameson, Search Committee, Range Science Department, Colorado State University, Fort Collins, Colorado 80523. Detailed criteria and a further description of the Department are available upon request. Letters of reference may be submitted but will be required only for candidates reaching the interview stage of selection. Applications must be received by March 1, 1982. *CSU is EEO/AA employer. E.O. Office: 314 Student Services Building.*

RANGE MANAGER
VICTORIA
$2,862–$3,014
OUT OF SERVICE

Forests, Management & Development Section, resp. for standardizing Ministry policy application over 6 Forest Regions relative to range allocation, use, rehabilitation, development and management systems; evaluating and promoting functional planning processes; promoting use of best technology for each function; evaluating reg. effectiveness in above functions; developing range extension program for Br. in consultation with info. Br.; other related duties.
Qualifications–Licenced Prof. Agrologist, registered in B.C. Inst. of Agrologists; extensive exp. in integrated resource planning where some livestock ranging has been involved; knowledge of relevant legislation; proven oral and written communication skills; initiative and good interpersonal skills. Considerable travel required. Lesser qualified may be appointed at lower level.
Competition HB1:1005
Closing Location-Victoria

Range Science Faculty Position

Position: Teaching and research in Range Science Program at Brigham Young University, Provo, Utah.

Date available: Fall semester, 1982 (begins about August 25).

Qualifications: Ph.D. degree or near completion in range science or closely related science, at least one degree in range science or management required.

Duties: Teach courses in range science and occasionally, as needed, in general biology, ecology, and natural resources; counsel range science students; carry out an active research program.

Salary and rank: Commensurate with qualifications and experience; tenure track.

Application: Submit letter of application along with curriculum vitae, graduate and undergraduate transcripts, and three letters of recommendations by Jan. 15, 1982, to John F. Vallentine (search comm. chm.), Brigham Young University, Provo, Utah 84602 (ph. (801) 378-2278).

Equal opportunity employer: Brigham Young is an equal opportunity employer. The person selected must be willing to conform to the behavioral standards of the University, specifics provided upon request.

CO-PRINCIPAL INVESTIGATOR/ASSISTANT OR ASSOCIATE PROFESSOR/RANGE MANAGEMENT RESEARCHER IN OUR COOPERATIVE RESEARCH AREA

Full time permanent portion to begin January 1, 1982. This position is 100 percent research. The initial responsibility will be to work as a Co-Principal Investigator on a warm-season grass ecological study that is now in progress. Must have Ph.D. in Range Science or allied fields. If the Ph.D. is in an allied field the applicant must have a strong background in range related sciences. A working knowledge of plant and animal taxonomy is required. Interested applicants send resume, three letters of recommendation and transcripts to Personnel Office, Lincoln University, Jefferson City, MO 65101. An Equal Opportunity/Affirmative Action Employer.

Requiescant in pace

Avon Denham, a longtime leader in rangeland management, died July 31 in Portland, Oregon, at the age of 76.

Mr. Denham, a resident of Portland since 1952, served as assistant regional forester in the management of range and wildlife resource programs for the Pacific Northwest Region of the U.S. Forest Service for 14 years until his retirement in 1966. He was a charter member of the Society for Range Management and a member of the Portland chapter of the Izaak Walton League.

He was born in Montrose County, Colo., and graduated in 1928 from Colorado State University at Fort Collins. He served for 14 years in several forest and range managemen capacities in the San Juan (formerly the Montezuma) National Forest before working in the San Francisco and Washington, D.C., Forest Service offices. Survivors include his wife, Mattie Kay; a daughter, three sisters, and two brothers.

George M. Van Dyne, a professor of biology at Colorado State University, internationally known grassland ecologist, and a Life Member of the Society for Range Management, died at his home in Bellvue, Colo., August 2 of an apparent heart attack. He was 48.

Dr. Van Dyne, a native of Pueblo, Colo., was author, co-author or editor of nine books and monographs as well as 125 professional papers in national and international scientific journals. He also wrote parts or all of 25 other special reports and had 35 additional manuscripts in press or in preparation at the time of his death.

He was a pioneer in the relatively new scientific discipline of systems ecology in the early 1960's. In 1964, he and two colleagues organized the world's first course in that subject at the University of Tennessee. At CSU he was teaching a graduate-level course sequence in the modelling and analysis area, "Systems Ecology and Ecological Models," in the range science department.

Van Dyne received an associate of arts and science degree at Pueblo Junior College (now University of Southern Colorado) in 1952, a bachelor of science degree in agriculture (animal husbandry) magna cum laude from Colorado Agricultural and Mechanical College (now CSU) in 1954, master of science degree in animal husbandry (nutrition) from South Dakota State University in 1956, and a doctorate in nutrition (biometrics and biochemistry) from the University of California, Davis, in 1963.

From 1954 to 1956 he taught at CSU and Montana State College before returning to graduate school at Davis. After receiving his doctorate, he accepted a joint appointment in 1964 in the radiation ecology section of Oak Ridge National Laboratory and the botany department at the University of Tennessee.

He returned to CSU in 1966 as associate professor of biology with a joint appointment in the departments of range science and fishery and wildlife biology in the College of Forestry and Natural Resources.

Within a year, Van Dyne had begun a program that brought CSU more than $25 million in research grants over nearly a decade. This was the Grassland Biome Study of the International Biological Program (IBP), a worldwide endeavor by ecologists in the West, Eastern Europe and Asia to cooperate in furthering understanding of ecosystems.

He served on many national and international scientific panels and committees and was a member of professional and honorary societies.

Surviving Van Dyne are his wife, Sallie H. Van Dyne, his mother, Stella M. Van Dyne of Pueblo, Colo., and four children, two sisters, a brother, and two stepsons.

Contributions for a George M. Van Dyne Memorial Scholarship Fund may be sent to Colorado State University, College of Forestry and Natural Resources, Fort Collins, Colo. 80523.

Members round about

Barron S. Rector was appointed range specialist with the Texas Agricultural Extension Service, Texas A&M University, System. He will be engaged in planning and conducting statewide educational programs aimed at range improvement and range management. Rector has been a graduate research assistant for the Texas Agricultural Experiment Station at San Angelo for the past four years while working on his doctorate degree.

Paul G. Risser has been appointed Chief of the Natural History Survey by the Board of Natural Resources and Conservation. He previously was chairman of the Department of Botany and Microbiology, University of Oklahoma. Prior to the appointment as chairman of his department at the University of Oklahoma in 1978, Risser served as Program Director of Ecosystem Studies for the National Science Foundation, Director of the Oklahoma Biological Survey, and Assistant Director of the Oklahoma Biological Station.

John Hunter of Texas Tech Department of Range and Wildlife garnered several teaching honors during the 1980-81 academic year. They included the President's Award for Excellence in Teaching and the AMOCO Outstanding Teaching Award (each with $1,000), Conservation Teacher of the Year by the Lubbock County SWCD, and Outstanding Teacher at Texas Tech by the Collegiate Chapter FFA.

Robert C. Baum, Salem, Oregon, has been named president of the Soil Conservation Society of America following the resignation of Jesse L. Hicks, Raleigh, North Carolina. Baum, who is the Pacific regional representative for the National Association of Conservation Districts, will serve the remaining two months of Hicks' term, then begin an additional one-year term as president of SCSA.

October Workshop

A workshop on using computers and programmable calculators for Reclamation Planning and Air Quality Control at Surface Coal Mines will be offered at Montana State University, Bozeman, October 20-22. For further information contact: Dr. M. Douglas Scott, Institute of Natural Resources, Montana State Univeristy, Bozeman 59717-(406) 994-2432.

Bitterbrush and Cliffrose Symposium

A symposium on the ecology and management of bitterbrush and closely related shrub genera of the *Rosaceae* will be held April 13-15, 1982, in Salt Lake City, Utah. Two days of paper presentations will be followed by a day field tour of wildland shrub research and management in central Utah. Sponsors will be Utah State University Extension and the Intermountain Forest and Range Experiment Station.

Papers are invited on research and management of antelope bitterbrush *(Purshia tridentata)*, desert bitterbrush *(Purshia glandulosa)*, Stansbury cliffrose *(Cowania mexicana)*, and Apache-plume *(Fallugia paradoxa)*.

Titles and abstracts of no more than 300 words must be submitted by December 1, 1981, to Dr. Arthur R. Tiedemann, Shrub Sciences Laboratory, 735 North 500 East, Provo, Utah, 84601. Notification of acceptance will be completed by January 1, 1981, and a symposium brochure will be available for distribution shortly thereafter. Persons interested in receiving the brochure, or in any other details of the symposium, should contact Dr. Kendall L. Johnson, Cooperative Extension Service, UMC 49, Utah State University, Logan, Utah, 84322.

Wildlife Film Festival

The UM Student Chapter of the Wildlife Society announces the Fifth Annual International Wildlife Film Festival. The Festival was established in 1977 to encourage the production of high quality wildlife films.

For more information on any aspect of the Festival, write or call Wildlife Film Festival, Wildlife Biology Program, University of Montana, Missoula, Montana 59812, (406) 243-5272.

2nd International Rangelands Congress

This is the second Congress organized for the benefit of rangeland users, researchers, administrators, and educators. It follows on from the successful Congress staged in Denver, U.S.A. in 1978. The Adelaide Congress is being organized by the Australian Rangeland Society. It will benefit from the co-operation of a number of organizations and the governments of the States within Australia.

Why Another Congress?

Rangelands occupy over 50% of the world's land surface. Millions of people of the world over depend on rangelands for their livelihood. Many of these lands are faced with threats of desertification brought out by expanding human and livestock populations. Even the more technologically advanced nations are caught up in the expansion of desert-like conditions. The unprecedented demands for fibre and food for a hungary world are the root cause.

Increasingly, the world's rangelands are looked to as places where harried people from urban centres can recreate and relax. This new and expanding use of the world's rangelands is having major impacts on wildlife and, in many instances, the indigenous peoples. Australia is no exception.

Why Australia?

As a New World country, Australia is a developing nation in every sense of the word, but at the same time is a technologically advanced country.

Australia has much to offer the rangeman. There is a vast area of rangeland with about 75% of the entire land surface classified as arid zone. In addition there are millions of hectares of tropical and subtropical rangelands poised on the brink of a major development. There are alpine and temperate rangelands with a major role as catchment areas, for this the driest continent on earth.

Perhaps it was for these reasons, among others, that the Continuing Committee invited Australia to be host for the 2nd International Rangelands Congress.

Who are the Planners?

The Council of Australian Rangelands Society has agreed to the formation of a Central Committee to organise the Congress. Members of the Committee are:

Dr. V.R. Squires	Chairman
Mr. R.A. Perry	Deputy Chairman, Finance Committee
Mr. P.J. Joss	Secretary/Treasurer
Mr. O.B. Williams	Chairman Editorial Committee
Dr. R.T. Lange	Chairman Local Arrangements Committee
Mr. D.G. Wilcox	Chairman Program Committee
Mr. P.W. Lynch	Chairman Public Relations Committee
Dr. R.D.B. Whalley	Chairman Tours Committee
Dr. I. Beale	Member Program Committee
Dr. G.N. Harrington	Member Program Committee

Why Adelaide?

Adelaide is the capital city of South Australia. Adelaide, a city of about 1 million people is the closest city of any Australian capital to the arid interior. It is a modern city with much to offer the visitor. It will be the terminus for the pre-Congress tours and the starting point for the post-Congress tours.

Where Do I Find Out More?

Correspondence should be sent to *2nd International Rangelands Congress, CSIRO, Private Bag, Deniliquin, N.S.W. Australia 2710.*

(Courtesy of the City of Calgary)

You are invited to the
1982 Annual Meeting of the Society for
Range Management in
CALGARY Alberta
Canada
February 8—12, 1982

From the Prairies to the Pingos

Calgary, whose name comes from the Gaelic word meaning "clear running water," was born in the late summer of 1875. A contingent of the North West Mounted Police set up a camp near the confluence of the Bow and Elbow Rivers.* For eight years Calgary was only a minor post with Rocky Mountain House and Fort Edmonton being major centres in the north and Fort Macleod being active in the south.

In 1883 the Canadian Pacific Railway reached Calgary and by the end of the year the town's population was 600.

A great ranching industry developed, with Calgary as one of the largest centres of cattle marketing. The lush grazing encouraged owners of tremendous herds to move north from over-grazed U.S. ranges. Free homesteads to settlers brought such a rush of pioneers to the area that by 1893 Calgary was granted a charter as a city. Farming joined ranching to give the city a thriving economy and in 1914, when oil was discovered 50 km south at Turner Valley, a new era of prosperity began. Some 500 oil and related companies with capital of 83 million dollars were established in the city and Western Canada's great petroleum industry had begun. When oil was discovered in other parts of Alberta in 1947, the exploration and development companies chose to stay in Calgary. During the past three decades, large new discoveries have been made and Calgary has sustained a phenomenal growth. With this influence, sleek sky-scrapers have appeared on the sky line and spacious suburban subdivisions have risen. The downtown core has been built practically during the last decade and construction continues. The population is over 600 thousand with 80 new Calgarians arriving every day.

Calgary remains the headquarters of the Canadian beef industry, and the annual bull sale is the largest of its kind in Canada.

Summer temperatures average 18 to 21° C. (65 to 70° F) with ten hours of sunshine daily. January is another story, with the lowest temperature recording being -43° C. (-45° F). Temperatures in February (over convention time) average -8° C. (18° F) mean daily with a daily high average of -2° C. (29° F), but the temperature may be much higher or lower than average. Often in winter the crescent shaped clouds herald the coming of a chinook. The temperatures may rise as much as 30° within an hour, but it may also drop just as suddenly. Calgarians have learned to cope with the cold. Numerous walkways underground and above the street connect downtown buildings.

*Colonel James Macleod, the grandson of an SRM member of the International Mountain Section. John Cross of Nanton was the founder of Calgary, naming it after Calgary Bay near his home on the Isle of Mull.

The Program

The program, following the theme "From the Prairies to the Pingos"* will feature northern rangelands. The plenary session which begins Monday afternoon will include climate, land forms, vegetation, fauna, and insects of the north. Concurrent sessions will begin Tuesday morning and the business section will convene at 3:00 p.m. Wednesday afternoon.

The banquet is scheduled for Wednesday evening at the Calgary Inn.

*If you haven't yet heard of a Pingo, you're in good company—neither had most of the convention committee! It's a land-ice form found in the Arctic, the exact nature of which you can learn at the meeting.

The Pingo Prance

The Pingo Prance is scheduled for Tuesday evening following the President's Reception. The Prairie Fire Band has been engaged to entertain us from 9:00 p.m. to 1:00 a.m. The Prairie Fire Band is a versatile group which will play a wide variety of dance music. This will be an evening where various age groups will mix.

Ladies! Spouses! and Others!

The program begins at 9:00 a.m. Tuesday, February 9, when the bus leaves the Calgary Inn for Spruce Meadows and the Leighton Centre. Spruce Meadows is one of North America's finest equestrian facilities. The tour and an equestrian demonstration will be followed by an informal luncheon. The Leighton Centre for Arts and Crafts will then be toured. The workshop, teaching facilities, and the many arts and crafts collections will be seen. Following coffee, buses will depart for the hotel with an expected arrival at 3:30 p.m.

Breakfast in the Calgary Tower and a tour of the Glenbow Museum have been arranged for Wednesday, February 10. Buses will leave the Calgary Inn at 8:30 a.m. Enjoy a leisurely breakfast as you view Calgary from the slowly rotating Panoramic Room of the Calgary Tower. Following the guided tour of the renowned Glenbow Museum, you will stroll back to the hotel via shops and enclosed over-street walkways.

A city tour, luncheon, and fashion show have been arranged for Thursday, February 11. Buses will leave the hotel at 9:30

a.m. and take you through some of the interesting areas of Calgary. A stop at Heritage Park will give you a glimpse into early Alberta history. Here, luncheon will be served at the "old" Wainwright Hotel. The buses will be returning to the hotel at 2:30 p.m.

One-day skiing trips to Banff can be arranged in the lobby of the Calgary Inn. Arrangements can also be made for skiing packages, which include transportation and tow tickets, for the weekends before and after the convention.

Post-Convention Tour

A bus trip to the picturesque Canadian Rockies has been organized for Friday, February 12. Banff National Park is located 130 km. west of Calgary and is a great recreational area year round. In winter the Rockies are famous for their ski slopes. The tour will feature lunch at the Banff Springs Hotel and a tour of this magnificent structure.

Registration

For your convenience a pre-registration form is included below. Pre-registration will not only save you money, but it is a tremendous help to the annual meeting committee, allowing them to plan arrangements and events with a degree of certainty that will ensure a better meeting for all.

The pre-registration form has name and address on one side and the fee outline on the back. The registration will be checked and the receipt memo will be enclosed with your tickets in the registration package to be picked up upon arrival. The annual meeting pre-registration forms are to be mailed to Bud Klumph in Lethbridge, who will prepare the packages. Remember, **registration prior to January 8, 1982 will save you $10 per person registered.** All registration charges are calculated *in U.S. Funds.*

In addition to completing your registration you *must* reserve your hotel accommodation—use the accompanying form and mail to the Calgary Inn or make arrangements with a hotel of your choice.

Hotel Reservations and Information

SRM has a block of rooms reserved for our convention in the Calgary Inn (Westin Hotels). The Calgary Inn—our convention headquarters—will house nearly all of the events at the 1982 Annual Meeting. The backup hotel—the International Hotel of Calgary—is one block east of the Calgary Inn. It features large, suite type rooms which may suit students attending the convention.

Complete the reservation form and send it to the Calgary Inn. When the Calgary Inn becomes filled, requests for reservations will be referred to the International Hotel. Other accomodations shown on the map may be acquired by writing or phoning the hotel of your choice.

Students wishing to stay at the International Hotel: send the second reservation to the International Hotel.

SRM SOCIETY FOR RANGE MANAGEMENT

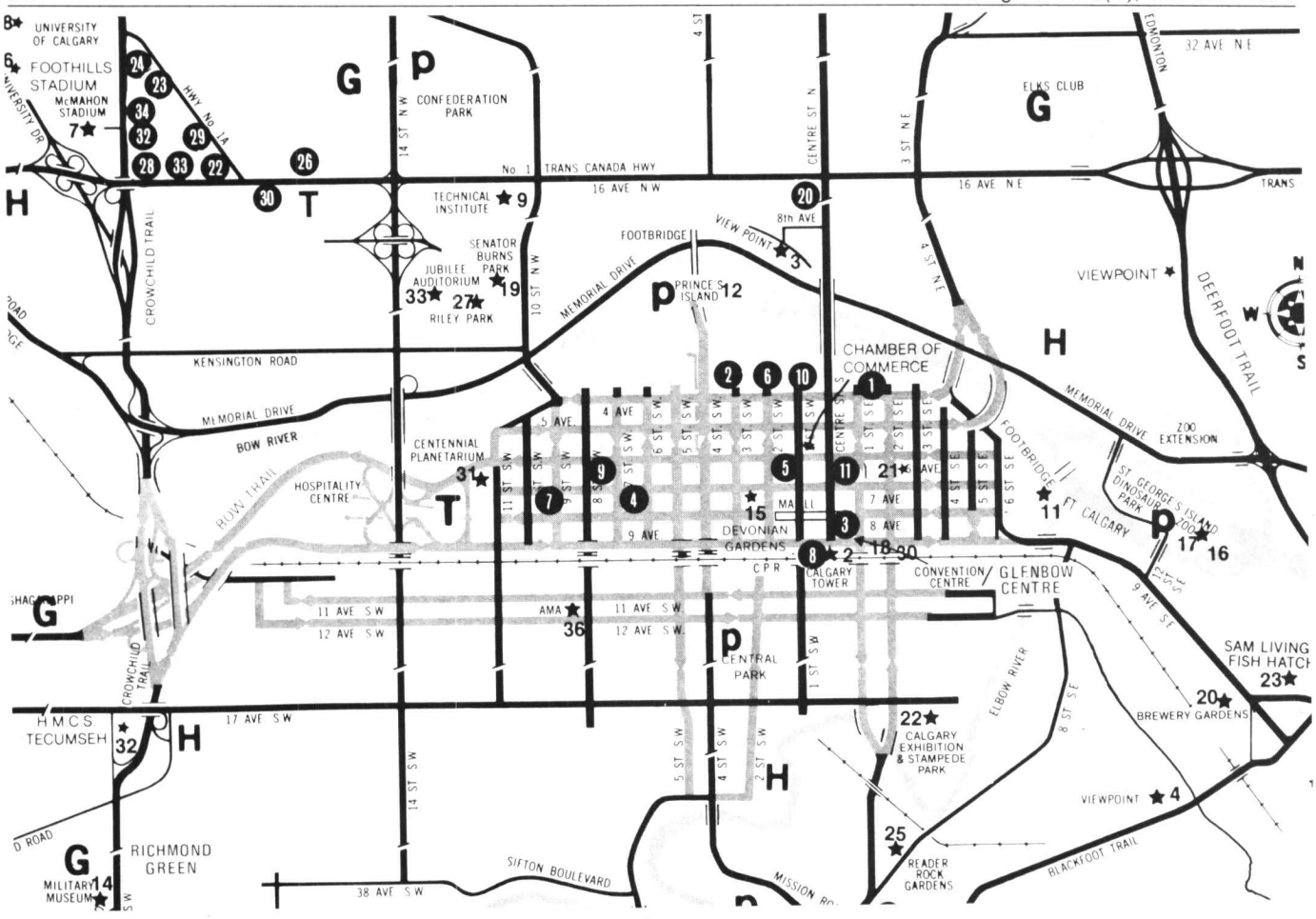
1982 Annual Meeting
Calgary, Alberta, Canada
Pre-registration Form

For reduced registration: Please send this form to be received not later than *January 8, 1982,* to:

Bud Klumph
Chairman of Registration
Sun Centre
530 - 8th Street, South
LETHBRIDGE, Alberta CANADA
T1J 2J8

(Please print legibly)
NAME: _____
ADDRESS: _____
_____
NAME OF SPOUSE (if attending): _____

Please complete the reverse side and enclose cheque or money order in the proper amount to SRM Annual Meeting (all amounts are in U.S. funds or equivalent). NO REFUNDS AFTER JANUARY 22, 1982. (ONLY BY WRITTEN CANCELLATION).



RECEIPT MEMO

Please fill in your name and pick up at registration desk.

NAME: _____

Registration:

Member	$ _____
Student	$ _____
Spouse	$ _____
Banquet	$ _____
Pingo Prance	$ _____
Spouse Tours (Tues.)	$ _____
(Wed.)	$ _____
(Thur.)	$ _____
Post Convention Tour	$ _____

SRM REGISTRATION COMMITTEE

BY _____

Convention Registration (includes Convention registration packet, program, abstract and wine and cheese Sunday night)	Pre-registration received PRIOR to January 8, 1982.	Regular or Pre-Registration Received AFTER January 8, 1982.	Cost of Selected Items
	(U.S. funds, Canadian dollars accepted at par)		
Members	$50.00	$60.00	$ _____
Student Members	$20.00	$30.00	$ _____
Spouse	$15.00	$25.00	$ _____
Tickets for:			
Banquet	$18.00		$ _____
Pingo Prance	$ 9.00		$ _____
Spouse Tours:			
Tuesday-Spruce Meadows	$13.00		$ _____
Wednesday-Calgary Tower	$ 8.00		$ _____
Thursday-City Tour	$12.00		$ _____
POST CONVENTION TOUR	$20.00		$ _____
		Total Amount Enclosed	$ _____

Full refund available only by written cancellation received prior to January 22, 1982.

SOCIETY FOR RANGE MANAGEMENT
Annual Meeting February 8-12, 1982

DOWNTOWN CALGARY

1. **BOW VALLEY INN (Delta Hotels Limited)**
   209-4th Avenue S.E. Postal Code: T2G 0C6. Phone: 266-1980. Telex: 03-827880. 400 units. Rate D. Facilities: A,B,D,E,F,H,J,K,L,M,N,O,R. Cards: 1,2,3,4,5,7,8,9.
2. **CALGARY INN (Westin Hotels)**
   320-4th Avenue S.W. Postal Code: T2P 2S6. Phone: 266-1611. Telex: 038-24547. 554 units. Rate D. Facilities: A,B,D,E,F,H,J,K,M,N,O,R. Cards: 1,2,3,4,7,8,9, 13,14.
3. **FOUR SEASONS HOTEL, CALGARY (Four Seasons Hotels)**
   Calgary Centre. Postal Code: T2G 2E1. Phone: 266-7331. Telex: 038-24711. 387 units. Rate D. Facilities: A,B,D,E,F,H,I,J,K,L,M,O,R. Cards: 1,2,3,4,7,8,9,11.
4. **HOLIDAY INN DOWNTOWN (Holiday Inns Inc./ Atlific Inns Inc.)**
   708-8th Avenue S.W. Postal Code: T2P 1H2. Phone 263-7600. Telex: 038-22637. 200 units. Rate D. Facilities: B,C,D,E,F,I,J,K,L,M,O. Cards: 1,2,3,4,8,9.
5. **HOTEL EMPRESS**
   219-6th Avenue S.W. Postal Code: T2P 0R2. Phone: 262-1141. Telex: 038-22568. 60 units. Rate B. Facilities: A,B,C,D,K,L,O. Cards: 2,3,8,9.
6. **INTERNATIONAL HOTEL OF CALGARY**
   220-4th Avenue S.W. Postal Code: T2P 0H5. Phone: 265-9600. Telex: 038-24710. 250 units. Rate D. Facilities: A,B,D,E,F,G,H,J,K,L. Cards: 1,2,3,4,7,8,9.
7. **LORD NELSON INN**
   1020-8th Avenue S.W. Postal Code: T2P 1J3. Phone: 269-8262. 56 units. Rate C. Facilities: B,D,E,F,G,K,L. Cards: 2,3,8,9.
8. **THE PALLISER (C.P. Hotels)**
   133-9th Avenue S.W. Postal Code: T2P 1J9. Phone: 266-8621. Telex: 038-22512. 340 units. Rate D. Facilities: A,B,C,D,K,L,M,O. Cards: 1,2,3,4,5,7,8,9.
9. **SANDMAN INNS**
   888-7th Avenue S.W. Postal Code: T2P 3G2. Phone: 237-8626. Telex: 03-821054. 301 units. Rate C. Facilities: A,B,C,D,E,F,G,H,J,K,L,M,N,O. Cards: 1,2,3,5,7,8,9.
10. **SHERATON CALGARY HOTEL (Sheraton Hotels & Inns, Worldwide)**
    202-4th Avenue S.W. Postal Code: T2P 0H5. Phone: 262-7091. Telex: 038-21718. 173 units. Rate C. Facilities: B,E,F,I,K,L,O. Cards: 1,2,3,4,5,7,8,9.
11. **YORK HOTEL (Utell International)**
    636 Centre Street South. Postal Code: T2G 2C7. Phone: 262-5581. Telex: 038-24539. 135 units. Rate B. Facilities: A,B,C,D,E,F,G,K,L,O. Cards: 1,2,3,4,8,9.

CREDIT CARDS FACILITIES

1. Air Canada
2. American Express
3. Master-Charge
4. BankAmericard
5. Canadian Pacific
6. Canadian National
7. Carte Blanche
8. Chargex/Visa
9. Diners Club
10. T.W.A.
11. Four Seasons
12. Travelodge
13. United Airlines
14. Western International
15. Major Oil Companies

A. Entertainment
B. Licensed Lounge
C. Tavern
D. Licensed Dining Lounge
E. Dining Room
F. Coffee Shop
G. Kitchens
H. Swimming Pool
I. Pool (seasonal)
J. Sauna/Whirlpool
K. Color T.V.
L. Cable T.V.
M. Pets accepted
N. Health Club
O. Air Conditioning
P. In-House Movies
Q. Water Beds
R. Wheel Chair Units

ROOM RATES

Room rate shown is the minimum price quoted for single occupancy. The following index is provided for your comparison:

ROOM RATE A—$30.00 & under
B—$31.00 - $40.00
C—$41.00 - $50.00
D—$51.00 & over

Room Reservation

SOCIETY FOR RANGE MANAGEMENT
ANNUAL MEETING — February 8 - 12, 1982.

MAIL TO: CALGARY INN (WESTIN HOTELS)
320 — 4 Avenue, S.W.
CALGARY, Alverta Canada
T2P 2S6

Please reserve a room at the following rate:

Main Single $80.00 ☐
Main Double $95.00 ☐
Tower Single $90.00 ☐
Tower Double $105.00 ☐

Room held until 6 p.m. unless guaranteed and confirm the reservation to:

(Print Legibly)

NAME: _____
MAILING ADDRESS: _____
CITY, STATE/PROVINCE: _____
POSTAL CODE/ZIP: _____
ARRIVAL DATE: _____ TIME: _____
DEPARTURE DATE: _____ TIME: _____

Convention Delegates: If no reservation is received by January 10, 1982, space availability cannot be guaranteed/

Room Reservation

SOCIETY FOR RANGE MANAGEMENT
ANNUAL MEETING—February 8—12, 1982

MAIL TO: International Hotel of Calgary
220 - 4 Avenue, S.W.
CALGARY, Alberta Canada
T2P 0H5

Please reserve a room at the following rate:

Single $75.00 ☐
Double $90.00 ☐
Each Additional Person $10.00 ☐

Room held until 6 p.m. unless guaranteed and confirm the reservation to:

(Print Legibly)

NAME: _____
MAILING ADDRESS: _____
CITY, STATE/PROVINCE: _____
POSTAL CODE/ZIP: _____
ARRIVAL DATE: _____ TIME: _____
DEPARTURE DATE: _____ TIME: _____

If no reservation date is received by January 10, 1982, space availability cannot be guaranteed.

M 296550

RICHARD M HANSEN
DEPARTMENT RANGE SCIENCE
COLORADO STATE UNI
FT. COLLINS, CO 80521

lands
0190-0528)
Vest Fifth Avenue, Denver, Colorado 80204
RN POSTAGE GUARANTEED