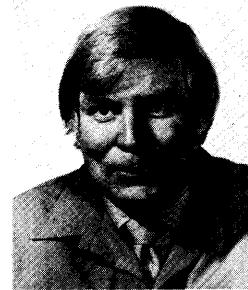


Food, Fiber, Fuel, and Fun from Rangelands



THADIS W. BOX

It has been a pleasure to serve as the thirtieth president of the Society for Range Management. In the beginning our Society was a small collection of dedicated people trained in forestry, animal science, agronomy, and ecology, and bound together only by a concern for and dedication to the management of the country's rangelands. In three brief decades it has developed into a group of well over 5,000 people with varying degrees of training in the field of range management. We, as a Society, speak for about 40% of the earth's surface. We are the major professional group that must produce the food, fiber, fuel, fun, all the goods and services that society wants from rangelands.

It may seem ludicrous that the thirtieth president of the Society for Range Management should begin his discussion with a definition of rangelands. However that may be, the concepts of rangelands are changing so radically today that a brief discussion is necessary.

The terms "range" and "rangelands" are of relatively recent origin. When John Wesley Powell (1878) wrote his treatise on the western rangelands, he did not even use the term, but talked of "pasturage lands." Soon after the turn of the century, descriptions of rangeland began to appear. The one included in the Senate report on the western range (U.S. Senate 1936) was typical:

The western range is largely open and unfenced, with control stock by herding; when fenced, relatively large units are enclosed. It supports with few exceptions only native grasses and other forage plants, is never fertilized or cultivated, and can in the main be restored and maintained only through control of grazing. It consists almost exclusively of lands which, because of relatively meager precipitation and other adverse climatic conditions, or rough topography or lack of water for irrigation, cannot successfully be used for any other form of agriculture.

In contrast the improved pastures of the East and Midwest receive an abundant precipitation, are ordinarily fenced, utilize introduced forage species, . . . cultivation for other crops, and are often fertilized to increase productivity, and are renewed following deterioration.

This was the prevailing concept of rangelands prior to the formation of the Society for Range Management.

Several authors gave definitions of range management in the early years of our Society. Rangeland was called "the land upon which the animals graze" (Clawson 1950). Sampson (1952) described range as "large, naturally vegetated, mostly unfenced lands of low rainfall areas that are grazed by domestic livestock and game mammals." Dyksterhuis in 1955 stated that a satisfactory definition of range appeared to be "native pasture on natural grazing land." Stoddart and Smith (1955) did not define rangeland but chose instead to define range management. They called it the science and art of obtaining maximum livestock production from rangeland consistent with the conservation of natural resources.

These definitions stressing livestock production and grazing from rangelands were the standard concept and definition of range until about the late 1950's and early 1960's. At that time rangeland began to be discussed as a particular classification of land with equivalent standings to that of forests or cropland. Most authors admitted that there were no specific characteristics that differentiated rangelands from either croplands or forests. Rangelands were described as being not suitable for croplands or intensive forests, their use being limited by aridity, rocks, shallow soils, rough topography, poor drainage, cold temperatures, and other physical features. Intensively managed pastures were also considered as range. Although most authors were reluctant to define rangelands, their descriptions were all similar. Range was recognized as a kind of land that can produce many goods and services. It is managed most effectively using principles of ecology rather than intensive agriculture or agronomic techniques (Stoddart, Smith, and Box 1975; Blaisdell et al. 1970; Colbert 1977).

The definition of range management has also changed over the years. When I was a student the definition I learned was from Stoddart and Smith (1955). Range management meant obtaining maximum livestock production from native vegetation. We were trained to produce a forage crop—native plants—and harvest it with animals—cattle, sheep, or goats. Range management today is defined as the science and art of optimizing the returns from rangeland in those combinations most desired by and suitable to society through the manipulation of range ecosystems (Stoddart, Smith, and Box 1975). Range management is involved in the production of many different goods and services, of which only one may be livestock products.

Unfortunately, many people still consider range as a use of land and not land itself. They equate range with livestock grazing. Even some agencies managing rangelands discuss the multiple uses of the land as timber, water, range, recreation, etc. Timber, water, and recreation are all goods or services and outputs of land. Range is the land itself. It can be used for the production of timber, forage, water, etc. Francis Colbert once said:

I want to emphasize in the strongest possible way that range—or range-land or range ecosystems—is a kind of land. It is not a land use.

I must admit that the word "range" has always been associated with livestock grazing (a specific use) on uncultivated lands, and this is the connotation that is still prevalent, especially to the general public (if, in fact, the general public thinks of it as anything else than the kitchen stove!). Nevertheless, rangeland comprises at least 40 percent of the total land area, not only in this country but in the entire world, so I believe it's time that we made a serious effort to recognize range for what it really is: a kind of land—a major land resource—from which there is, and can be, obtained a wide variety of products and values, of goods and services.

If range is a particular kind of land, distinguished from cropland and forest, what are the goods and services that can be expected from rangelands now and in the future?

Food from Rangelands

The traditional product most often considered when rangeland is discussed is food—red meat. Although many of the outputs of ranges are measured in animal unit months, the ultimate product that society desires is meat for the table. American is a land that has for many decades been blessed with food surpluses. We are now in one of those cycles when we are embarrassed by high food production and low food prices. One has only to look at the world population growth to see that this embarrassing surplus of food is ephemeral and that shortages are bound to occur in the future.

As the human population grows, more and more cropland will be used to produce food for direct human consumption. The amount of meat in the diets may decrease but it will still be the desired source of high quality protein when it is available. Livestock will be raised on crop aftermath and on native plants. The rangelands of the world will surely become more important, although many people in our affluent society find it hard to accept. The current attitude toward grazing on public lands, for instance, will change when food is in short supply. A few years ago a major western newspaper carried two articles on a single page. One was an article dealing with the suit of the Natural Resource Defense Council against the Bureau of Land Management. The Council, and apparently a large part of the U.S. public, wanted to ban grazing from the public rangelands. On the same page was an article from Japan. Japan, for the first time in its history, had opened its national forests and national parks to grazing. Because it was short on meat, Japan was willing to allow a new use for its lands. Our country, with its abundance, was trying to restrict grazing. My point is that attitudes change as the situation changes, and I predict that the attitude toward grazing of livestock on public lands will change rapidly in this country. Food production will be a major goal for rangelands in only a few decades.

Grazing of domestic livestock for food production will be the major economic use of rangelands. Rangelands, as we have discussed earlier, are usually vegetated with shrubs, forbs, and grasses. They are vastly different from the succulent, irrigated pastures of the farming regions. If we develop criteria for using rangeland as an engineer would if he were to design a harvesting machine, we would probably not design a cow to graze the rangelands. We want an animal that can breed, have young, and the young reach market weight within one year on the scant forage of rangelands, go for long periods of time without water, and withstand the rigorous climate of range areas. That animal probably would be a sheep or goat, not a cow. The preferred red meat of most Americans is beef. However, if rangelands are called upon to produce meat most efficiently, the ranges will probably be grazed by something other than a cow beast.

Fiber and Rangelands

Rangelands will be called upon to produce additional fiber in the future. It takes about twice as much energy to produce a synthetic fiber as it does a natural one (Thomas, Curl, and Bennett 1976). If my estimates are correct, it will take most of our arable land to produce food for direct human consumption. Our clothing will be produced from synthetic fibers and from fibers from rangelands. Wool and mohair are already a standard crop from many of the range areas of the world. If we accept my criteria for the kind of animal that will graze rangelands, then it follows that not only will sheep and goats become more prevalent for food production but many of them will be dual-

purpose animals, producing fiber as well.

It is not unlikely that industries producing fiber from native range plants may also develop. There are today a number of cottage industries in developing nations throughout the world that use yuccas, euphorbias, sisal, etc., to produce local fibers for baskets, ropes, and other useful materials. If efficient harvesting techniques could be developed, it is entirely possible that we may see fiber production from range plants become more important, at least locally.

An even greater possibility exists that wood fiber from low-value range plants could be used for the paper industry or for other products where wood cellulose is a building block. Literally thousands of tons of cellulose are left to rot each year after range improvement projects. Although such techniques are not economically feasible today, we may see the time when mesquite, piñon-juniper, sagebrush, and other low-value range plants are harvested during range-improvement projects and then processed into some other product useful to mankind. Although they are fiber plants, such range plants as guayle and jojoba, are now being studied for production of rubber and oil. If these industries develop on rangelands, they would release petrochemicals that could be used for the production of fiber.

Fuel from Rangelands

Many scientists now think that energy supply will be the ultimate limiting factor in the development of the world. Regardless of the validity of that statement, it is apparent that an increasing energy shortage will develop in the next two or three decades until alternate sources of energy are found (Cook 1976). Until that alternate source of energy is developed, our nation will be dependent on fossil fuels. As the most desirable fossil fuels, oil and gas, are gradually reduced in availability, we will shift to the more abundant coal. Much of the nation's low-sulphur coal occurs under western rangeland, as does the uranium for nuclear energy, and as do valuable geothermal sites, etc. It is inevitable that the rangelands of America will fill a key role in supplying the energy for this country.

In order to extract the materials from which energy is ultimately developed, it will become necessary to disturb much of the rangelands. These lands are costly to rehabilitate, often requiring thousands of dollars per acre to reclaim land that has a surface value of only a few hundred dollars per acre (National Academy of Sciences 1974). However, when the cost of rehabilitation is related to the product removed, it is seldom more than a few cents per ton of coal removed to rehabilitate the land.

We as a society for range management have a two-fold responsibility in the rehabilitation of western energy lands. First, we must provide the necessary scientific research and professional expertise. Second, we must insist that options be kept open for future generations and that rangelands be rehabilitated on the basis of their value to society for the energy rather than the surface value of the rehabilitated land for farming or ranching.

Proposals for the development of energy plantations are now under study in several of the forested regions of our country, the theory being that a renewable resource, trees, can produce fuel for the heat generation of electricity. If such fuel plantations are feasible in forested areas, it seems logical that the waste products from range-improvement projects could be burned to produce electricity. The main problem would be in harvesting and transporting the wood products to generating sites. No one would suggest such a scheme under the current economic

conditions. However, conditions could change.

Fun from Rangelands

Many range areas contain strikingly beautiful scenery. They produce wildlife herds that are valuable for viewing or recreational hunting and provide the basis for a growing recreation business.

Our cities are becoming more crowded and more unlivable. The search for solitude is a major goal of many people in the developed countries of the world.

The opening day of deer season each year finds hunters occupying almost every single acre of rangeland in the western states. In private land states such as Texas, hunting is already a business. The income derived from hunting leases may rival that from livestock or any other range product.

Hunting fees are not charged on public land, but the public demands that the land be managed for the production of wildlife. Anyone who has ever witnessed the opening day of deer season in Montana, Colorado, or Utah will agree that the production of wildlife is one of the most desired uses of rangeland. Although direct monetary return usually does not come to the land management agency from hunting, the restaurant owners, shopkeepers, and guides throughout the West have a direct economic return. The demand for hunting is likely to continue, even though the nationwide reaction against sport hunting is becoming stronger each year. The population continues to grow and Westerners are not likely to voluntarily give up the sport of hunting.

Picnickers, backpackers, campers, and others are finding that rangelands offer open spaces and a chance to get away from it all. Rock hounds now visit even the most remote and desolate areas of the public rangelands. Organized groups such as motorcycle racers or four-wheel-drive-vehicle clubs find rangelands a place to practice their sport, with the result that the uncontrolled use of off-road vehicles is now a major problem in range management.

Solitude remains one of the major objectives of many outdoor recreationists. The vast open spaces, deep canyons, and undeveloped areas of rangeland are also desirable for recreationists. Many range areas have high wilderness values and the conflict between wilderness users and other range users is likely to increase.

Other Rangeland Products

There will be products other than food, fiber, fuel, and fun produced from rangelands. Water will be increasingly more important. Timber, mining props, fence posts, and other wood products will be locally important.

Other uses may develop that we cannot predict at the present time. The point that I want to make is that rangelands will continue to produce a wide array of products, although in the foreseeable future the main product will continue to be animals and animal products. Grazing, though only a single range use, will probably be as important to range as timber production is to forest lands. The nature of the land and ecological principles dictate that rangelands are grazing lands. They evolved concomitantly with grazing and browsing animals and, for the foreseeable future, grazing land they will remain. If these predictions are true, what will be the role of the Society for Range Management in the next 30 years?

The SRM's Role in the Next 30 Years

The Society for Range Management has done well in the first

30 years. We have given birth to a new profession and raised it through adolescence. During the next 30 years we will nurture it in its early adult years. A major role will be leadership in the continuously changing definition of rangelands and range management. We will develop new concepts and apply knowledge gained in the past. On the one hand we will work toward applying the body of knowledge that has been developed in the first 30 years. On the other, we must push forward to new frontiers and pioneer new research. We as a professional Society should not simply react to the demands of the public. We must set the standards under which rangelands of the world will be used.

To do this we need to develop and constantly maintain a professional image. We must at all times be scientifically credible. We must speak from a position of strength backed by sound data and research. This will be difficult, because we have as a policy accepted all those into our Society who have an interest in rangeland. We have never claimed to be an exclusive or elitist group. We accept people on the basis of their concern for the condition of rangelands of the world. One of our major strengths has been the diversity of people and our mutual acceptance. This open attitude we must somehow keep, but at the same time we must become judgmental, especially of those in our midst who do not keep our code. This year we have begun a program of certification of consultants. Its standards are high. Not all who belong to the Society for Range Management will qualify, but those who do will have the stamp of approval of this Society. We have also initiated a program of accreditation of range schools. Again, not all will qualify, but those that do will meet a certain standard of excellence that we as a Society think is desirable for the management of rangelands. I predict that more such actions will be necessary in the future.

Our ability to balance love and judgment—accept all people on confession of faith but endorse their actions on stringent professional criteria—will determine how successful we will be in the next 30 years. It has been a pleasure being your president.

It is inevitable that the demands placed on the rangelands of the world will change and change rapidly in the next few years. If our Society can anticipate and direct those changes, then we will be successful. If we only react to them, we will slowly fade away, and my guess is that our absence will be noticed by no one.

Literature Cited

- Blaisdell, J. P., Vincent L. Duvall, Robert W. Harris, R. Duane Lloyd, and Elbert H. Reid.** 1970. Range research to meet new challenges and goals. *J. Range Manage.* 23:227-234.
- Colbert, Francis T.** 1977. Land use planning: a summary from a rangeman's point of view. *Rangeman's J.* 4:74-76.
- Cook, Earl.** 1976. *Man, Energy, Society.* W. H. Freeman Co., San Francisco. 478 p.
- Clawson, Marion.** 1950. *The Western Range Livestock Industry.* McGraw-Hill Book Co., New York. 401 p.
- Dyksterhuis, E. J.** 1955. What is range management? *J. Range Manage.* 8:193-196.
- Ford Foundation.** 1974. *A Time to Choose, America's Energy Future.* Ballinger Press. Cambridge, Mass. 512 p.
- National Academy of Sciences.** 1974. *Rehabilitation Potential of Western Coal Lands.* Ballinger Publishing Co., Cambridge, Mass. 197 p.
- Sampson, Arthur W.** 1952. *Range Management, Principles and Practice.* John Wiley and Sons, Inc., New York. 570 p.
- Stoddart, Laurence A., and Arthur D. Smith.** 1955. *Range Management,* 2nd Ed. McGraw-Hill Book Co., New York. 433 p.
- Stoddart, L. A., Arthur D. Smith, and Thadys W. Box.** 1975. *Range Management,* 3rd Ed. McGraw-Hill Book Co., New York. 532 p.
- Thomas, Gerald W., Samuel E. Curl, and William F. Bennett, Jr.** 1976. *Food and Fiber for a Changing World.* The Interstate Printers and Publishers Inc., Danville, Ill. 225 p.