Evolution of Multiple Natural Resource Management in the Range Profession

Lorenz F. Bredemeier

Our concern is *natural* resources as contrasted to resources in general. The words *evolution*, *resource* and *range* require some explanation before proceeding. I chose to define *evolution* as any process of formation or growth. *Resource* means a renewable natural resource and excludes non-renewable natural resources such as coal and other minerals. Also excluded are human and institutional resources. *Range* refers to areas of volunteer native forage plants, with the two major kinds as determined by climatic and edaphic factors, and commonly occurring on rangeland and forestland. Hence *range* is a permanent potential plant cover of natural rangeland and may be temporarily on natural forestland.

The range profession leads in the guidance of proper management on rangeland used for range. It also is concerned with grazable growth on forestland and with supplemental forage or hay from cropland associated with an economic operating unit. Also, it is concerned with management of watersheds, wildlife, and recreation on rangeland. In these latter areas, the professions of forestry, agronomy, animal science, economics, watershed management, wildlife, and recreation must be recognized. Proper roles and reasons for them were reviewed in a requested editorial titled *What is Range Management?* by Dyksterhuis in the Sept. 1955 issue of the *Journal of Range Management*.

Multiple Natural Resource Management is defined as: managing two or more available tangible and/or intangible resources on a specific area of the earth's surface, land and water, for two or more products or values within a twelve-month period under a system for maintaining or improving the resources.

Review

The human race from the beginning has used multiple natural resources. Early humans obtained their food, shelter, and other essentials for survival from the land and water. During settlement of North America multiple resource use was necessary for survival of the private land owners. They used their cultivated fields, grassland, and woodland for any and all available products.

The private landowners pioneered natural resource management in an evolutionary way without recognition. They did so as opportunities and demands developed. The evolution of the *hunting for fee* in Texas is a good example.

The evolution of multiple resource management on public land may have began in German forestry before this century.

The 35-year index to the *Journal of Range Management* categorizes 49 articles under multiple use, the category closest to the assigned topic of "Multiple Resource Management". The first article appeared in volume 2, followed by three in volume 3. To arrive at some historial perspective in multiple natural resource management in the range profession, the 49 articles were categorized by subject into private land, public land, social/economic, and education/technology. During the first 20 years, including 1967, 11 dealt with privately owned rangeland, 4 with public land, 2 social/economic, and 3 education/technology. During the next 5 years, including 1968 through 1972, there were none concerning private land, 10 on public land, 3 social/economic, and 2 education/technology.

A thorough review of all articles did not contribute facts on the evolution of the topic. Some reported on success with multiple resource use but nothing specific on management. Several reported on research and 3 on livestock grazing, wildlife, and timber in different combinations. In the past we talked more multiple use than we applied or implemented in our profession.

Evolution of Multiple Use

Evolution of multiple resource use on private land evolved concurrently with needs and demands. There was more use than management until the conservation movement in the 1930s. On public lands in the United States, the evolution would correlate with the creation of the U.S. land managing agencies, the main two being the U.S. Dept. of Agriculture, Forest Service and the U.S. Dept. of Interior, Grazing Service, now the Bureau of Land Management.

In 1936 the 600-page paperback titled *The Western Range, A Great But Neglected Resource* was printed as U.S. Senate Document # 199. It was prepared by the U.S. Forest Service with assistance from many government units, both public and private. It contained several references to multiple use and the merits of the concept. In 1940, G. A. Pearson published an article in Vol. 36 of the *Journal of Forestry* stating in summary that "Multiple Use is not a product of studied planning" and that "the obvious answer is land classification". In the 1930s the Soil Conservation Service, U.S. Dept. of Agriculture, was

Editor's Note: This paper was presented at the Symposium "Does the Range Profession Fulfill Its Claim to Multiple Resource Management" at the 1989 Annual Meeting, SRM, Billings, Montana, February 1989.

established with H.H. Bennet, a soil scientist as chief. Under Bennet the S.C.S. instituted land classification based largely on a soil survey. Land capability became the first consideration in planning land use and treatment, whether under single or multiple use.

In the Feb. 1981 issue of Rangelands, Holechek presented A Brief Review of Range Management in the United States. He reported that during the 1960's the multiple use concept was elaborated for federal lands, stressing recognition of wildlife, water, and recreation. He also covers in more detail the conditions that influenced the evolution of multiple use management in the range profession. Also in the 1960's the Soil Conservation Service began a resource development program in the northern portions of Minnesota, Wisconsin and Michigan. We developed criteria for inventorying the resources and projecting their potential uses. From 1965 to 1969 I was responsible for training U.S.D.A., S.C.S., state, area, and local personnel in a procedure to identify resource areas, then inventory the resources and project potential uses. They then led in doing this with input from Conservation district leaders, extension agents, and personnel of state and county agencies with land and resource managing responsibilities. Their projected resource uses and kinds of enterprises became objectives in the Soil Conservation District's action programs.

By the late 1970's there was a concern over world population and the merits of low energy input to produce food from range as compared with cropland. This caused renewed interest in using public rangelands for livestock production. By 1988 the pendulum had evidently swung back. The Aug. 88 issue of *Rangelands* has 5 articles on diversified or multiple use of range, with some including nonrenewable resources. The Sept.-Oct. issue of the *Journal of Soil and Water Conservation* reports points of agreement in *The Grazing Lands Forum for Promoting Multiple-Use Values of Grazing Lands.*

Evolution of Range Technology

The evolution of range technology, which is the basis for sound multiple natural resource management, correlates closely with the evolution of knowledge as effected by the establishment of colleges and universities. In the United States the first studies of concern to our profession involved plants, as evidenced by explorers' records, often recorded by doctors. The study of plants became the field of botany. The next phase involved plant communities and concerns for which kinds, where they were growing, and why. This led to delineating different forests, grasslands, and deserts. Then followed studies of plant community environments and the science of plant ecology. Concurrent with advances in plant science were advances in soil science. Both sciences began to direct attention to the interaction between soil and plants as well as plants and soils. Both sciences recognized the influence of climate on their entity. Tansley, a foremost British ecologist, presented a comprehensive approach for understanding the interaction and relationship of vegetation, soil, and climate. This supported Clements of the U.S.A. but in a more easily understood format. His comprehensive diagram of plant succession presented fundamentals of the range profession. The Ecological monograph, *The Vegetation of the Fort Worth Prairie* by Dyksterhuis (1946) provided much impetus in the Soil Conservation Service for soil scientists, range conservationists, foresters, biologists, and agronomists to work together and make progress on this interrelationship.

As early as the last half of the 1800s, overgrazing was commonly recognized as the cause of range deterioration. Stoddart and Smith in their 1943 book, *Range Management*, stated that the student of range management must strive to learn the signs of various degrees of over and under use of rangeland. During the 1940s in Nebraska the S.C.S. helped farmers and ranchers seed highly erodible cropland and sandhill abandoned cropland to native grass mixtures. During that time specifications for pure live seed mixtures adapted to each range site were developed. Unfortunately there was in the profession a tendency to emphasize range reseeding for range improvement and a neglect to emphasize proper degree of grazing use.

My first lesson in proper grazing use was when as a child, our parents took us on a Sunday afternoon outing in the 1919 buick touring car. This often included a drive through the pastures to check the cattle, salt, etc. Mother commented that there was a lot of grass remaining, this being August or September. Father said that is good, he wanted it to come up to the running boards of the car, that being about 12 inches. He said it is not wasted, it will catch snow, reduce runoff, and in the spring the cattle will eat it along with the new grass growth and the cows will do better changing from hay to green grass.

Early approaches to range management focused on plant cover with a discount for those species considered to be poor forage quality. There seemed to be a subdued consciousness of what should or could be growing on the site. In the late 1930s and early '40s, in Nebraska and other Great Plains states, the Soil Conservation Service tried to use range and pasture condition guides designed for soil conservation districts. These listed the percentages of species considered desirable, less desirable and undesirable in four range condition classes. They proved to be unworkable. Moreover this approach did not accommodate the dynamics of vegetation that responds to edaphic differences and history or degree of grazing use. Those guides were mainly geographically oriented. In 1945 while working with a Nebraska Sandhills rancher I used the knowledge of ecology learned from Dr. John E. Weaver. While going over his ranch I discussed the condition of the vegetation on the different soils, pointed out the plants that were growing and the more productive ones that could grow on each site. Based on this information the rancher inaugurated a range management program and was honored 4 or 5 years later with the Sioux City Iowa Chamber of Commerce Range Conservation Award. When asked what started him on the program he said, "What the man said made sense." Dyksterhuis (JRM 1949) introduced an ecological approach on range management which put together unorganized ecological knowledge into a logical simple approach that made sense and is easy to present to ranchers and achieve acceptance.

Ecology became the basis for the range profession and is so recognized by the Society for Range Management. Odum (1959) in his Second Edition, Fundamentals of Ecology, stated, "Fortunately for the new world, the science of range management is coming of age while the destructive trends may yet be reversed. For the future of our great west and the country as a whole, there is no more important phase of applied ecology than range management". A monograph titled, Ecological Principles in Range Management, was presented to the American Association for the Advancement of Science by Dyksterhuis and reported in the Botanical Review for 1958. It helped regain the respect of many ecologists and other vegetation scientists in the range profession. Many may not know that when the American Society for Range Management was organized, many ecologists and botanists joined because they visualized it to be a society that would be involved in applied ecology. While organizing the Northcentral Section, some of these early members told me that the Society for Range Management seemed to become a grazier/cowboy organization so they discontinued their membership. This was a most unfortunate conclusion. These professionals are needed as well as the graziers and cowboys who apply the technology. We must reach out and involve in our programs and activities the graziers, the basic scientists, and all other professionals concerned with rangeland resources.

Another important advance in range management technology was recognition of the ecosystem concept emphasized in several speeches by Tex Lewis at Society meetings but apparently not published in the *JRM*. The paper *Ecosystem Approach in Teaching* by Cook (1970) emphasized the need for interdisciplinary knowledge for maintaining professional stature. SRM President William Hurst, in his address at Reno in 1971, advised that we recognize ourselves as a group of the foremost range ecologists in the world. The ecosystem approach is a sound foundation for multiple natural resource management. It should be emphasized that there is no conflict between high ecological range condition and greatest benefits from management for single or multiple uses of renewable natural range resources.

Recommendations

Many Society for Range Management members have been concerned about SRM's ability to grow and compete for professional stature and recognition in the everincreasing competition. The Society should create a special task force to prepare recommendations for improving its stature and working relationships with scientific and quasi-political organizations concerned with use and conservation of renewable natural resources. This task force should include representation from the entire array of professionals within the society and outside interests related to rangelands.

One of the problems we have in communicating and understanding one another is that we do not define our management objective at the outset. We need a definition for management objective. We can then inventory the vegetation on the basis of the potential for the site, which is climax, then define the management objective in terms of that potential or suitable vegetative characteristics.

Let us build on what has proven successful, move ahead, and not try to reinvent the wheel every generation or so. Read President Hurst's 1971 address at Reno, specifically the last half, JRM 1971. We must involve those from related technologies and reduce the time when we talk to ourselves. We must involve *all professionals*, the ranchers, ecologists, soil scientists, biologists, economists, animal specialists, and others involved in use and management of the renewable natural resources on rangeland.

To be recognized as professionals we must conduct ourselves as professionals, look like professionals, and be sensitive to deportment and appearance.

Literature Cited

- Cook, C. Wayne. 1970. Ecosystem approach in teaching. J. Range Manage. 23(6):387-391.
- **Dyksterhuls, E.J. 1946.** The vegetation of the Fort Worth prairie. Ecol. Monog. 16:16-29.
- **Dyksterhuls, E.J. 1949.** Condition and management of rangeland based on quantitative ecology. 2(3):104-115.
- Dyksterhuls, E.J. 1955. What is range management. J. Range Manage. 8:193-196.
- **Dyksterhuls, E.J. 1958.** Ecological principles in range evaluation. The Botanical Review. 24:253-277.
- Heimlich, Ralph. 1988. Promoting and multiple-use values of grazing land. J. Soil and Water Conservation. 43 (5):374-375.
- Holechek, Jerry L. 1981. A brief history of range management in the United States. Rangelands. 3(1):16-18.
- Hurst, William D. 1971. President's Address. J. Range Manage. 24(2):83-85.
- Odum, Eugene P. 1959. Fundamentals of ecology. 546 p. W.B. Saunders Co. Philadelphia and London.
- Pearson, G.A. 1940. Forest land use. J. Forestry. 38:261-270.
- Society for Range Management. 1987. Thirty-five year index to J. Range Manage.
- Stoddart, L.A., and A.D. Smith. 1943. Range management. 547 p. McGraw-Hill Book Co. Inc. N.Y.
- U.S.D.A. 1963. Northern Great Lakes Resource Development Committee.
- U.S.D.A. 1963. Land and People, Conference Proceedings.
- U.S. Government. 1936. The western range, A great but neglected natural resource. Senate Document No. 199.