

Range Youth Education: An Assessment

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As population pressures increase and rangeland resources become more scarce and valuable, greater demands will be placed upon them for wise use. It is imperative that young people be informed about rangeland resources and their relationship to environmental, economic, and cultural issues at local, national, and global levels. Unfortunately, the general level of knowledge of young people concerning range management and natural resource issues is low (Stechman 1982, Orr 1992). This indicates a need to reassess youth education programs.

Young (1951) recognized the need to develop youth education programs in range management for 4-H and for elementary and secondary grades during the early years of the Society for Range Management (SRM). He called for the formation of a committee to investigate the possibility for developing materials and introducing range management to youth in every state where range management was important. Since that time, several SRM sections, in conjunction with universities and land management agencies, have been active in developing materials and programs for youth. However, we are not reaching as many youth as we would like. Out of the 5.6 million youth enrolled nationally in 4-H projects in 1991, 1.2 million were enrolled in natural resource related projects, but only 3,859 of those were in range management projects (Table 1).

Table 1. National 4-H total, natural resource, and range management enrollment for selected years between 1982 and 1991 (Annual 4-H Development and Enrollment Summaries).

Year	Total Enrollment	Natural Resource Enrollment	Range Management Enrollment
1982	4,763,021	36,018	3,220
1985	4,337,458	53,993	2,104
1991	5,657,657	1,256,140	3,859

It has generally been accepted that public schools should play an instrumental role in environmental education. Since Earth Day 1970, one of the most important and visible products of environmental education has been the broad-based support for the environmental movement. Unfortunately, most environmental education continues to be emotionally laden, and focused on environmental

dysfunction rather than the systematic knowledge of causation and possible solution (Gigliotti 1990).

This assessment addresses three issues that impact the future of range youth education: (1) our understanding of human development in relation to the environment, (2) the availability and suitability of educational programs and materials, and (3) the influence of educator attitudes and competencies on the quality of instruction. Recommendations are provided for the improvement of range youth education in the future. Due to the specific nature of range youth education and the organization of youth education literature in the natural sciences, this assessment includes references to the broader areas of natural resources and environmental education.

Issues

Human Development and the Environment

Educators from all walks of life (4-H leaders, public school teachers, agency personnel, etc.) need to know that a framework for organizing knowledge about natural resources can be coordinated with a developmental framework for understanding how a young person's knowledge of the natural world changes with age and experience. Rejeski (1982) described three stages of development related to the natural environment: (1) literalism (ages 6–7), where the young child integrates the sun, sky, plants, animals, etc., into a simplified, symbolic concept of nature and cannot yet imagine changes in scale necessary to understand ecosystem structure through the use of visual metaphor or analogy; (2) organization (ages 9–10), where the child begins to classify objects not usually classified together, develop a sense of basic spatial concepts, and gain an awareness of human intervention in the natural environment; and (3) moralism (ages 13–14) where the adolescent can make more informed value judgements based on a valid working knowledge of basic ecological concepts and an awareness of the viewpoints of others.

Research on attitudes, values, and cognitive development shows that elementary school years to the 8th grade, and particularly ages 10–13, offer the greatest opportunities for acquiring knowledge and understanding about the environment (Miller 1975). Thus, educators need to understand changes in perceptual and cognitive capabilities as children (and adolescents) develop, and create an appropriate framework for organizing knowledge (programs and materials) about rangeland resources, other natural resources, and the environment.

Materials and Programs

A variety of materials and programs, developed for

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This paper is a condensed version of the chapter, "Youth Education (Pre-College)," in the upcoming text *Range Management Education in North America: History, Current Status and Future*, developed by the SRM Futures in Range Management Education Task Group.

SRM youth activities, 4-H activities and public schools, are available for teaching young people about the management of rangeland resources and other natural resources, and about environmental education in general.

In 1987, the SRM Student Affairs Committee sent a questionnaire to all SRM sections asking about range youth education activities. Thirteen of the 20 sections responded, indicating that youth are involved in 4-H and FFA range and plant judging contests (8 sections), field days and tours (2 sections), range/natural resource camps (12 sections), and the High School Youth Forum at annual SRM meetings (6 sections). The most important activity for almost every section was the range/natural resource camp for high school youth during the summer. Several of these camps have been operating for 30+ years and attract as many as 50 youths each year. "Top campers" in many of the summer camp programs are sent to the High School Youth Forum at the annual SRM meeting. Participants in the High School Youth Forum have the opportunity to develop and present a paper on a range-related subject, meet with representatives from federal land management agencies, academia, and private industry, and attend symposia and technical sessions covering a wide variety of range-related topics. Youth camps and the High School Youth Forum are probably the best recruiting tools for bringing interested youth into the range profession.

An area of concern in range youth education has been the development and availability of appropriate programs and materials for pre-high school youth (ages 9–14). Range management projects have been part of 4-H programs since the late 1950's, but range management was not an individual line item in 4-H until 1982, when the National Grazing Lands and People Conference recommended that 4-H take a leadership role in strengthening a program to educate youth about fundamental land management concepts and the values of rangelands (Dyer 1988). Even with this emphasis on range youth education, 4-H range management enrollment has accounted for less than 0.1% of the total 4-H enrollment and has decreased from 8.3 to 0.3% of the natural resources enrollment from 1982 to 1991 (Table 1). The availability, usefulness, and appeal of literature and materials have been cited as leading factors in this decline in two recent studies (Dyer 1988, Busby 1989).

Dyer (1988) reviewed 47 pieces of 4-H range youth literature written between 1968 and 1987 and found that most were written by subject matter specialists (researchers and land managers) experienced in technical fields, but not in curriculum and project material development. They lack the experience and skills to develop activities and lessons that will captivate the interests of 9-year-olds. These materials would be most effective when designed in conjunction with specialists in education and child development.

Busby (1989) evaluated the reading level of 25 current 4-H range management project manuals/handbooks from 11 states, and the readability of other environmentally

oriented literature for youth, using the Fry Readability Graph (Fry 1977). The lowest reading level found in existing 4-H range management literature was at the 6th grade. About one third of the literature was found to be written at the 7th grade level, and an equal amount was written for high school grades. Two publications were written at a level for freshman in college. Many of these publications are well written and illustrated and contain numerous activities to help youth develop knowledge and skills, but all are written above the reading level of the beginning member (age 9, grades 3–4). In contrast, material published by the Boy Scouts of America was found to be suitable for the age of beginning 4-H members (ages 9–11). Similarly, Pomerantz (1986) found that environmentally oriented children's magazines such as *Ranger Rick* (National Wildlife Federation) were popular with young readers (ages 7–12) because articles about modern-day environmental issues and natural histories of plants and animals were written with straightforward scientific presentation, in a story-book format, in verse, and from a personal experience perspective.

While evaluating the readability of 4-H range management literature, Busby (1989) also noted that the dominant message was that rangeland was primarily used for livestock production. These materials should be more oriented to multiple use concepts, especially since we have become more urbanized in rangeland regions over the past few decades. Urban and suburban youth, with little or no knowledge and experience in resource use, will be the major clientele for natural resource education programs. It seems apparent that 4-H projects that desire to have a large enrollment must address the almost 50% of the 4-H members who live in cities with greater than 10,000 inhabitants.

The Extension Service has recently addressed several of these problems associated with 4-H range materials. Lacey et al. (1990) developed a manual for the Western 4-H Range Project which introduces young people (ages 9–12) to rangelands, basic ecological concepts, environmental awareness, plant anatomy, and uses of plants. The livestock orientation dominating earlier range management project manuals has been eliminated, making it more relevant for urban and suburban youth interested in natural resources and sciences. The authors intentionally "toned down" the vocabulary, reading level, and technical content of the manual to accommodate younger, less experienced youth. This manual serves as a basis for more advanced range projects as youth mature.

Meaningful sets of materials that cut across disciplines are in demand for grades K-12. Nationally distributed materials, such as Project Learning Tree (American Forest Council 1988) and Project Wild (Western Regional Environmental Education Council 1988) tend to dominate over locally and regionally oriented materials. Both sets of materials were developed with the goal of a balanced presentation of information, and neither industry nor conservation organization representatives believe that their own point-of-view has been exclusively repres-

ented. A major underlying theme is that in natural resource use there are no right and wrong answers, only wise and intelligent choices. The authors stress that the goal of the teacher should be to help students develop skills in evaluating information and in making careful decisions rather than to indoctrinate them with "correct" opinions.

Other nationally distributed materials include Investigating Your Environment (U.S. Department of Agriculture, Forest Service), and NatureScope and Class Project (both from National Wildlife Federation). The previously described Western 4-H Range Project (Lacey et al. 1990) is part of a 4-H enrichment program that is being extended into elementary classrooms in the western states. Project WET (Water Education for Teachers) is establishing water education programs for students in grades K-12 in 13 western states (Western Watercourse 1990).

We need to be aware of the variety of emphases, biases, and opinions which are manifested in materials and programs available to educators (Hart 1981). Simmons (1989) cautions that nationally available materials such as Project Learning Tree and Project Wild may represent the environmental education community's definition of environmental education put into practice. Actually, most of the biases in instruction are introduced by the instructors, depending on which activities they select and how they interject their personal opinions, attitudes, and beliefs (Ramsey and Rickson 1976).

Although a great deal of information has been amassed concerning the broad topic of environmental education, most does not focus on natural resource instruction. No subjects specifically entitled Natural Resources were found in the core curricula of public school systems in several western states that face critical natural resource issues (Van Niel 1990). In response to this perceived deficiency, Van Niel (1990) developed a curriculum framework to serve as a definition of natural resources education and become a reference point from which educators and resource persons could work. The framework provides educators not trained in natural resources issues a way of identifying essential elements to be explored when providing natural resources instruction. The framework also provides natural resource professionals not trained in education a way of identifying essential elements to be explored when providing information to educators and to students. Francis et al. (1993) recently developed a teaching model that integrates life and physical sciences, sociology, political science, and communication to produce a context for understanding ecological concepts, natural resource systems, and environmental issues, and is applicable in most environmental situations and settings.

Teacher/Leader Competencies and Attitudes

Volunteer leaders in 4-H (and other educational organizations and teachers at all levels and in all subjects in public schools influence young people's attitudes towards natural resources and associated management issues.

What educators teach is considerably influenced by what they know and feel.

Increasingly, Extension is being forced to rely upon volunteer leaders to implement 4-H activities and projects; thus, the volunteer-member relationship is becoming more important than the agent-member relationship in attracting and retaining youth in 4-H. Few parents or other willing adults are trained in, or have ever been exposed to, range, forestry, fisheries, ecology, and earth science (Stechman 1982, Dyer 1988). In addition to volunteer leaders, Dyer (1988) found that many 4-H administrators, subject matter specialists, and agents were not familiar with the concepts of rangelands and range management. These individuals are unlikely to encourage participation and enrollment in the 4-H range project area. Low enrollment projects, such as range management, may suffer because some of the key success factors, knowledgeable administrators and volunteer leaders, are lacking. Quality training (workshops) in range management and general ecology content areas, group dynamics, and teaching methods would help alleviate this problem.

Educators in public school systems are generally not well versed in natural resources management or in many of the natural sciences. In a comprehensive study of science education in the U.S., Rutherford and Ahlgren (1990) concluded that few elementary school teachers had even a rudimentary education in science, and many secondary teachers of science did not meet reasonable standards of preparation. In a more specific resource management subject area, Beiswenger et al. (1991) found that the majority of 450 elementary educators surveyed in Wyoming had inadequate knowledge of several critical water resource topics.

All teachers should be well informed about the environment and associated natural resource issues because they are entrusted with informing students and implanting values. Nonscience teachers, especially at the elementary level, appear to be in the best position to influence pupils toward constructive environmental views and apparently are the least prepared via content knowledge to do so (Ham and Sewing 1987-88). It must be shown that a strong science background is not a prerequisite for teaching natural resource/environmental subjects. Content and skills can be learned in workshops for non-science teachers (Ham et al. 1987-88).

Summary and Recommendations

Very simply, young people represent the future of range management, as consumers of rangeland products, as participants in a variety of decision-making processes concerning range issues, as educators in formal and/or informal settings, as members of the range profession, etc. The general level of knowledge of most young people about rangelands and range management, and the underlying ecological and socioeconomic concepts that affect range management, is low. Programs have been developed for youth organizations (e.g., 4-H) and

for public schools to inform young people about rangeland resources, other natural resources, and environmental issues. Low enrollment in the 4-H range management program and a slowing of progress in natural resource and environmental education in public schools have been attributed to conceptual barriers (misunderstanding of scope and content of subject areas), logistical barriers (lack of time, funding, and resources), educational barriers (teacher/leader competencies in subject areas), attitudinal barriers (teacher/leader attitudes toward subject areas), and a lack of appreciation of human development in relation to environment.

Based on the findings of this assessment, several recommendations are offered to reduce some of these barriers:

1. Gain a better understanding of how young people develop their understanding and attitudes toward rangeland resources and other natural resources, and develop an appropriate framework for organizing essential information/knowledge about rangeland resources and the environment (Rejeski 1982). Range management specialists should work with specialists in education and child development when developing youth materials to ensure that they are written at the appropriate reading level, and have interest and appeal, in addition to proper content (Busby 1989, Lacey et al. 1990).

2. Create range/natural resource camps for younger age groups, in addition to camps already in place for high school age youth. Ages 10–13 apparently offer the greatest opportunities for acquiring knowledge and understanding about the environment (Miller 1975).

3. Become involved in organizations such as the Western Regional Environmental Education Council and help revise existing programs (e.g., Project WILD) or create new programs (perhaps Project RANGE); and/or prepare articles for popular, wide-circulation outlets such as *Ranger Rick* (National Wildlife Federation).

4. Develop in-service workshops to reduce conceptual, educational, and attitudinal barriers that inhibit 4-H volunteer leaders and public school teachers from conducting range management education, especially for those individuals who do not have strong backgrounds in science.

5. Make youth education a more visible, professional component of annual SRM meetings by creating a permanent technical session for education and supporting occasional symposia on education topics such as human development and the environment, learning strategies, teaching methods, and curriculum and program development.

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