also that removal of the mulch soon after the spring mowing promotes poorer seasonal growth than leaving the mulch on; however, the overall differences indicated by cover measurements were small, particularly on the older plots.

The benefits of mulch removal for prairie plant growth may depend on the weather during the growing season. Mulch removal may promote growth during cool, wet years by permitting earlier warming of the soil and evaporation of excess moisture, but mulch left on the soil may help prevent excessive moisture loss and protect the plants during hot, dry years.

The effects of mowing the older plots at the end of the growing season appeared to be only slightly less beneficial overall than mowing in April; however, removal of debris and mulch in the fall will provide decreased protection to the dormant grasses during the winter that could be detrimental. Also, weed control is less likely to be effective because foods have already been stored in roots or rhizomes, and weed seeds have been dispersed.

Mowing in June seems definitely harmful to prairie grasses during the year of mowing. The treatment may or may not control weeds depending on the weed species and growing conditions.

RECOMMENDATIONS

The following management procedures relating to mowing or burning are recommended for the restored prairie at Pea Ridge National Military Park:

1. The prairie should be observed at least once each year to determine growth of prairie grasses, amount of mulch, and numbers and kinds of weeds and woody species present.
2. Recommendations for management practices should be made yearly on the basis of the annual observations.
3. At least for the present (1982) and probably the next few years, all plots should be mowed every 2 or 3 years and the mulch left on.
4. If mulch cover later becomes excessive for good growth or prairie grasses or prairie forb populations start decreasing, then mulch should be removed shortly after mowing.
5. Burning in April should be considered if increases in woody species become a problem or mowing and mulch removal do not maintain good growth of prairie grasses and cause suppression of prairie forbs.

ACKNOWLEDGMENTS

Grateful acknowledgment is made to the Southwest Region, National Park Service for financial support of this study and to Betty Gentry, Superintendent, Pea Ridge National Military Park, and her staff for their cooperation and assistance.

LITERATURE CITED


INVOLVING STUDENTS IN PRAIRIE PRESERVATION

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Abstract. The philosophical basis, including direct involvement and attitude change theory, for involving students in prairie preservation is discussed. Practical examples are included.

My interest in involving students in prairie preservation and restoration dates back to 1963 when I met Ray
Schulenberg of the Morton Arboretum. Ray, who had started the Arboretum prairie restoration project, helped us start our own prairie “garden” of no more than 800 square feet at Camp Reinberg near Palatine, Illinois. We worked with college students acting as part-time student teachers and 5th and 6th grade students from nearby schools.

My interest intensified when I became a member of the Faculty of Outdoor Teacher Education, Northern Illinois University, at the Lorado Taft Field Campus near Oregon, Illinois. My regular course assignments, in addition to various workshops and resident work, are Field Science and Outdoor Interpretation. In the 2 courses, technical and aesthetic aspects of nature study are combined. Outdoor Education trains teachers to use the outdoor in order to enhance their own curricula. Since Illinois is known as the Prairie State, an important part of each of my courses is prairie study. It is important to me for my students to acquire positive attitudes toward prairie.

In order to involve students without duress, positive outlooks and positive reactions must be developed. Intellectual and emotional aspects must both be reached. The cognitive (knowledge), affective (attitudes), and behavioral (action) aspects of education must all be addressed. Both knowledge and appreciation should be stressed. Together, they are more powerful than either separately. Knowledge alone can become an intellectual exercise, without meaning. Appreciation without knowledge can dwindle; at some point, enthusiasm will sag.

Direct involvement is the best teacher, and develops the greatest commitment. Both outdoor education and attitude-change theory stress direct involvement. L. B. Sharp, a pioneer in outdoor education, stated: “. . . the best way to learn is to come into contact with the things we seek to know.” (“What Is Outdoor Education?” The School Executive 71:19-22, August, 1952) and “It is the person who sees, discovers, or explores a situation who gets the most out of it.” Attitude-change theory states that involvement changes attitudes in a positive direction.

I have identified 11 necessary and helpful elements of involvement:

1. Stress both information and appreciation
2. Provide for direct experiences
3. Appeal to the aesthetic senses
4. Develop and instill appreciation
5. Appeal to the imagination
6. Appeal to the intellect
7. Provide pleasant experiences
8. Encourage a sense of community
9. Provide positive reinforcement
10. Allow camaraderie and peer pressure to exert influence
11. Be sure that good leadership is available

Following are some of my more successful experiences in involving students.

My favorite experience with grade-school children goes back to Camp Reinberg, when one of my fall teaching responsibilities was the prairie lesson and walk to the prairie “garden.” The lesson usually began with a discussion. “How many of you were born in the town where you now live?” Not many. “How many of your parents were?” “Grandparents?” Fewer still, if any. “That was a long time ago. Can you imagine what this part of Illinois was like before your grandparents were born?” We then discussed the sea of grass, how it looked, how it felt to the early pioneers, and what they might have felt if they had lived then. “Imagine yourself there.” We imagined breaking through the woods as the pioneers did, and being amazed by the “sea of grass.”

As we walked through the woods, excitement mounted. When we finally broke through the underbrush into the light, a hushed, “Look, there’s the prairie!” could be heard, followed by “Oohs,” and “Aahs.” The children were so eager to see the prairie that anything would do, even an abandoned farm field.

When we actually got to the prairie, I tried to create a feeling of awe at the size of the grasses and forbs. “How might you have felt if your entire yard had been surrounded by these plants?” “Can you reach the top?” “Could your little brother or sister get lost in these grasses?” (Always a favorite with 5th and 6th grade students.) Years later, I heard from a student who remembered “Mrs. Outdoor Education and the Prairie.” It stayed with them.

Involvement techniques used in this experience included the use of imagination and personal involvement (on a mental level)—an important interpretive technique.

My current field science classes explore, discover, and discuss ecosystems. Through their studies, they develop an appreciation for the diversity of systems around them. By the time we visit a prairie, students have studied 1 or 2 ecosystems on their own. They have found delight, gratification, and joy in discovery, and have known pleasure in being able to recognize different habitats. At this point, they have developed an appreciation for diversity, and can recognize the wonder in a tiny flowering plant; so they are ready for prairie.

A prairie lesson generally begins with a lecture and discussion focusing on the importance of grasslands as the heartlands and breadbaskets of the world, and their role in the development of civilization, trade, and number systems.

We discuss Illinois’ prairie heritage. A map of the state 150 years ago with prairie areas marked provides an impressive visual image of recent, rapid changes. We then focus on the few remnants that are left, and the far-sighted people who were instrumental in preserving and restoring what little we have now.

For our visit to a prairie, I prepare a species list of plants in the order in which we will see them. The list is not all-inclusive. People can gather and digest just so much information at one time; a long list can turn off novices. My list includes only those plants that are in bloom or have some eye-catching feature. If students ask for more information, I provide it. I make it a point never to overwhelm anyone with information. They may bring a field guide if they wish to do some investigating on their own.

I let the students ask questions; I never read the species list to them. Someone will usually ask, “Is this a cone-flower?” which, of course, it is. They continue through the prairie and the species list, questioning, discovering, and feeling the rewards of positive reinforcement.

We stroll slowly through the prairie. This is a casual, relaxed experience. I believe in introducing the study of prairies through an appeal to the aesthetic senses, not through hard work. They leave with a new appreciation of the prairie and a sense of commitment to find and preserve what we still have. Many of the students from these classes have become actively involved in prairie preservation in their own schools and towns.
Involvement techniques used in this experience include an appeal to intellect, providing information, an appeal to the aesthetic senses, providing a pleasant experience, and positive reinforcement.

My classes in outdoor interpretation visit prairies on field trips. By the time they visit, they already know that the message and the technique by which it is presented are important, so they are cooperative in experiencing another technique. My favorite way to experience prairies (especially since most of them are surrounded by civilization, in full view) is to lie down and watch the grasses waving against the sky. A marvelous sense of isolation and peace results from seeing golden brown against azure blue.

We then peruse poetry books. While the class sits or lies in the grass, I read my favorite prairie poem. Class members follow with readings of their own. It is something like a Quaker meeting. During an appropriate silent time, I quietly begin to leave and the others follow.

After sharing words about the prairie, the students disperse and spend about 20-30 minutes individually developing interpretive programs for the prairie, aimed at any target group of their choosing. They then share and react to their plans.

Involvement techniques used in this experience included an appeal to aesthetic senses, use of the imagination, involvement and choice: whether and what to read, positive, immediate reinforcement, a sense of community and positive leadership.

Possibly my favorite experience in involving students in prairie work took place the summer of 1982, when Doug Wade and I took my field science class to work in Ogle County's Bicentennial Prairie. It rained until the moment we arrived, when the sun came out, and the temperature quickly soared to over 90°. We were hot, wet, and dirty from head to foot. Yet we worked with feelings of camaraderie, joining in an occasional work song led by the class spirit booster. We accepted each other's feelings when 2 of the women decided that a bird's nest was more important to save than a few square feet of prairie. Cooperation prevailed; some of us pulled weeds and cut sumac, others hauled them away to a burn pile. When individuals got bored with their jobs, they exchanged. Doug mowed the path while I cut and hauled with the class. We all left with a wonderful feeling of accomplishment at having helped preserve a small part of our heritage.

Involvement techniques used in this experience included a sense of peer pressure and camaraderie, a sense of accomplishment, a sense of belonging to and helping something bigger than one's self, and good leadership.

Perhaps this last item is the most important. A project needs a leader to make it work. If s/he is not really interested, it will show. The leader need not be what we commonly think of as charismatic, but rather someone who truly loves the project. Love creates its own charisma; enthusiasm is contagious.

This last experience was not objectively enjoyable, but the results provided enough positive reinforcement to make it subjectively enjoyable and rewarding. It seemed to be an excellent example of cognitive dissonance at work: the more unpleasant an activity, the more we have to convince ourselves of its worth to be involved in it.

Sometimes, cognitive dissonance seems to be what prairie preservation is all about.

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ANALYSIS OF THE UNIVERSITY OF WISCONSIN-MADISON PRAIRIE RESTORATION PROJECT

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Abstract. The Curtis Prairie of the Arboretum, initiated between 1936 and 1941, originally consisted of 46 species separately planted in 237 plantings. Forty-six percent of the plantings were successful and 38% unsuccessful. Nine common successful species spread widely over the prairie while 9 others persisted well, but with little or no spreading between 1941 and 1982. These latter are called documentary species since they precisely pinpointed their planting locations for the 1982 re-survey. From these key locations, all 237 planting areas could be determined within a m or 2. From this, the plant persistence and succession in each of these plantings could be accurately documented after the 40-year interval. Some spreading species were also documentary. Starting with old farmland, this prairie has been spectacularly successful. It has been designated by the Arboretum as "the world's oldest restored prairie."

The Arboretum's most outstanding successes in community establishment have been its prairies.

GRANT COTTAM, Management: Our first 45 years.

INTRODUCTION

The University of Wisconsin-Madison Arboretum, established in April 1932, was described by Longenecker (1941). The best account of its history has been given by Sachse (1965). The initial development of its prairies has been briefly and informally described by Sperry (1983) and Jordan (1983), while other random aspects of their development have been published by Curtis (1952, 1959), Cottam (1962), Zimmerman (1969), Anderson (1972), Cottam (1979), and by Greene and Curtis (1953). Popular descriptions of the Arboretum at Madison and its prairies have been issued by the Arboretum Committee in undated printings as a Guide to the Arboretum Prairies (1970) and The Arboretum (1982).