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A STRATEGY FOR INTEGRATING PRINCIPLES AND CONCEPTS OF WILDLIFE DAMAGE CONTROL INTO THE SCHOOL CURRICULUM

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ABSTRACT: This paper reports an approach to educating today's youth concerning the importance of regulating numbers of wildlife species that threaten property, products and health. The emphases are on preparing teachers to integrate principles and concepts into the existing curricular materials, justifying control measures with ecological understandings and economic information and dealing effectively with sensitive animal rights issues. Opportunities for integration of specific wildlife damage control topics are suggested for lessons in the life sciences, social sciences, health, language arts and mathematics. Examples of conflict between groups of different opinions about the seriousness of a pest's activities or appropriateness of control are given with rationale for resolution of the problem. Evaluation by the classroom teachers of the applicability and effectiveness of the strategy was generally enthusiastic.

Education of the public in the need for realistic manipulation of wildlife populations is critical to the successful management of our wildlife resources and enhancement of the quality of life for the citizens of the country. Historical prejudice, biased viewpoints and strongly entrenched attitudes still persist as barriers to public acceptance of necessary animal control measures. Although progress has been made in enlightening the public, vigorous and intelligent programs must be continued (Eddie, 1954).

Although public relations programs may be effective in passing enabling legislation and achieving public approval of practices for controlling specific wildlife damage problems the **opportunity** for long term public support lies in the education of school age children in basic ecological

subjects concepts and in understanding the threat of uncontrolled wildlife populations on their health, economic condition, and the environment in which they live. How can teachers who are faced with crowded schedules and increasing public demands for improved student performance consider adding the topic of wildlife damage management to the existing curriculum? The answer may lie in the skillful integration of ecological, sociological and health concepts and principles into the content of courses currently taught in the middle and high schools.

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Traditional course organization can be modified to include studies of beneficial and harmful animal human relationships. The injection of new material into an array of courses was described by Wickens (1979) in a plan to infuse environmental education into the school curriculum in California. No similar educational strategy for wildlife damage management was found in the literature.

The objectives of this project were to

field test and evaluate a plan to educate students in the benefits of wildlife damage management.

METHODS

Thirty Kansas teachers representing 5

taught in middle and high schools participated in the **educational project**. Preparation for implementation of the plan was acquired through inservice ecology workshops offered during summers or on evenings during the school year. Basic ecological, economic, health, sociological, historical and mathematical principles were presented in the context of wildlife damage control problems. Additional training was concerned with understanding the bases of conflicts between groups of different opinions about the consequence of a pest's activities or appropriateness of control. Rationale for resolution of conflicts were presented.

The plan developed a strategy for incorporating essential elements of wildlife damage management into 5 subject areas of the school curriculum. General objectives and 4 content or activity levels were described for the subjects of life sciences, social sciences, health, mathematics and language arts. The levels (1 to 4) suggest strategies for accomplishing the objectives. The teachers selected the level best suited to the grade being taught. Participating teachers examined texts and other materials used in their courses to identify specific topics where integration of wildlife damage management concepts, principles and activities were judged to be most effective in accomplishing the objectives. Existing lesson plans were adjusted to allow time for infusion of selected information and activities. The plan presented here is a condensed version of the working model used in teacher workshops. Objectives and content levels are described for each of the S subject areas.

Course in Biology (Life Science)

Objectives: To demonstrate understandings of some basic generalizations, ecological relationships and principles applicable to animal populations and their management.

Level 1. Discusses and illustrates habitat requirements, food chains, annual cycles, carrying capacity, population surplus, and decimating factors.

Level 2. Describes the imbalances in predator-prey relationships as a result of agriculture and urbanization and how they may negatively impact human society. Recognizes historical changes in the vegetative landscape with settlement ("edge effect", overgrazing of rangelands, impact of exotics on the native flora and fauna, etc.).

Level 3. Identifies societal problems related to wildlife pests (disease transmission, depredation on crops and native vegetation, structural damage to buildings, contamination and consumption of stored foodstuffs, etc.). Examines strategies and methods of wildlife damage management.

Level 4. Identifies pest control problems the community and the publics affected, consul available wildlife damage management specialis and designs a plan implementing damage control"

Courses in Social Science (includes elements q American history, geography, economics an~ law)

Objectives: To understand how Europe settlement shaped our present North American environment and affected our relationships with wildlife. To acquire insights into the economic and social impacts of wildlife pests on the developing American society.

Level 1. Analyzes environmental and social factors that have shaped our present relationships with wildlife (urban development, economics, lifestyle and attitude changes, animal rights issues, etc.).

Level 2. Evaluates the effectiveness of various wildlife damage control methods (bounty system, translocations, depredation insurance, guard dogs, repellents, traps, poisons, etc.) and their affect on the integrity of the ecological system and their impact on society.

Level 3. Describes operations of governmental agencies and political bodies that develop wildlife damage control policies. Examines state and federal laws that regulate control of pest wildlife. Develops procedures to acquire information and assess attitudes toward wildlife damage control programs in the community.

Level 4. Demonstrates a long-term commitment to work individually and with others to promote the understanding of wildlife pest problems and to support ecologically sound and socially responsible control methods. Consults with wildlife control specialists and develops a wildlife damage management plan for the community.

Course in

Objectives: To develop an understanding that an environment out of ecological balance may negatively affect the mental, social, and physical well being of the human population in the area. To identify health threatening wildlife species, and participate in activities to promote their control.

Level 1. Examines the relationship between man and animals that transmit human diseases and Amfifles major animal borne diseases (rabies, hanta virus, plague, typhus, tularemia, leptospirosis, histoplasmosis, brucellosis, etc.).

Level 2. Describes the interrelationships between human life-styles and kinds and severity of wildlife pest problems (sanitary conditions, available and affordable medical services, nutrition, educational level, etc.).

Level 3. Considers ways of altering human activities and managing the ecosystem to reduce the threat of animal borne disease without adversely affecting environmental quality.

Level 4. Analyzes ways in which individual citizens and communities can participate in activities to reduce the incidence of

Course in Language Arts (English)

Objectives: To employ basic communication skills as a means of working with others to solve wildlife pest problem's.

Level 1. Talks to others and writes stories that emphasize the benefits of controlling wildlife pest species.

Level 2. Assembles a bibliography of articles, journals, and books that address wildlife damage management topics. Writes an essay on methods of controlling wildlife pests.

Level 3. Prepares and delivers effective written and oral communication to elected officials, representatives of resource management agencies, and extension wildlife control specialists. Requests information or expresses opinions on current wildlife damage management issues.

Level 4. Prepares and delivers effective written and oral communication to elected officials, representatives of resource management agencies, and extension wildlife control specialists. Requests information or expresses opinions on current wildlife damage management issues.

Level 5. Develops a plan to communicate local wildlife damage control concerns to local newspapers. Prepares a talk on wildlife damage management for presentation to classes, school assemblies, and civic organizations.

Course in Mathematics

Objectives: To develop skills in the use of mathematics to quantify losses caused by wildlife pests (agricultural, health, property).

Level 1. Collects and evaluates data on wildlife damage in the community or state and communicates these data to others.

Level 2. Examines statistical techniques used in measuring various wildlife population characteristics. Locates scientific journal articles that illustrate statistical techniques used in wildlife damage control studies.

Level 3. Compares past wildlife numbers or wildlife numbers from other areas to present day numbers. Calculates increases or declines in populations and seeks explanations for changes.

Level 4. Identifies a community, national or international wildlife pest problem and assembles statistical data on it. Uses graphs, charts or other means of mathematical communications to illustrate losses to society.

Six teachers from each of the 5 subject areas administered precourse and postcourse evaluation instruments to their students to monitor changes in understandings of wildlife values, animal population dynamics, perceptions concerning wildlife damage management, willingness to act in support of pest control programs, and opinions on use of the integration technique. Teacher responses to a questionnaire concerning the wildlife damage management integration plan were summarized.

RESULTS

The effectiveness of the wildlife damage management integration plan as an educational tool for introducing nonconventional material into the school curriculum was evaluated (Table 1). Teachers who participated in the project found major positive shifts in their student's knowledge and attitudes concerning wildlife damage management programs. They agreed that the success of the plan was based on the preparation provided by the workshops, their interest in the management of wildlife resources and the support of their school administration. All indicated they will continue integrating wildlife damage management into their courses.

DISCUSSION

The integration of principles and practices of wildlife damage management into existing subjects in the school curriculum was determined to be an effective educational technique and was highly successful in developing positive attitudes toward society's need to control pest wildlife. Primary difficulties in implementing the integrative plan on a large scale would be the limited availability of personnel prepared to teach the wildlife damage control workshops and the recruitment of teachers willing to attempt an unfamiliar educational approach.

LITERATURE CITED

- Edie, R W. 1954. Animal control in field, farm and forest. MacMillan Co., New York, N.Y.
- Wickens, D. L. editor. 1979. Course of study for grades kindergarten through 12 relating to environmental education. Alameda Co. Off, of Ed., Alameda, Calif 17 pp.

Table 1. Improvement in wildlife damage management test scores (X%) from precourse to postcourse evaluation.*
 Kansas 1994

Topics evaluated	Subject				
	science	Life science	Social science	Health arts	Language Math
Have an appreciation 9 for wildlife values	11	14	13		10
Understanding of 91 animal population dynamics	88	97	99		100
Level of awareness of the 93 influence of harmful wildlife on society		94	98	85	95
Could effectively 96 communicate to others concerning the necessity of wildlife damage management	94	98	93		97
Would donate time and 99 talents to support wildlife damage management in the community		85	88	92	97
Think that integration 97 of wildlife damage management would not be appropriate for this course		10	92	89	99

*sample of 80 students per subject