



The *Large-flowered Trillium*, which changes from white to pink, grows rapidly from seed in garden. Photo by C. R. Shoemaker.

Conservation Series, Unit VI

The Introduction of Natural Resource Planning into Our Schools of Today

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The metamorphosis of our nature teaching in the schools from an elective, esthetic, and extra-curricular activity to a dynamic required curriculum *MUST* has been taking place over the last ten years in a slow but determined way. Soon we shall see natural resource planning emerge in our natural and social science programs as one of the dominant and important interests which will influence many other fields such as art, writing, literature, sociology, history and government.

In states and cities where conservationists have approached school administrators with a sound practical approach to resource planning, programs have been introduced and conducted with surprising success. Whether these programs be called nature study, nature education, conservation education, or natural resource planning, they all must embody the fundamental concepts of conservation if they are to succeed and win the support from school people, who are already besieged by hundreds of new

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insofar as it does not endanger the main cause.

A second tenet is that the conservation education program be important and practical. It must remain within the possibility of execution within the schools. Administrators and teachers alike are reluctant to accept additions to their programs unless a definite need is felt and they can see how it can be incorporated into their already crowded program.



Gardens are of interest to boys and girls alike, in all grades of the elementary school. Cleveland School Garden Photo.

interests and in some cases by selfish groups.

One of the first tenets of a sound conservation program is that it be inclusive enough to encompass interests of the majority of the people. It will not be readily accepted if it caters to any special interest group. It can, however, include portions of many of the programs sponsored by these special groups.

Conservation is unselfish in its requirements, and yet it is often sponsored by groups that are selfish, biased, or narrow. In so many cases it has emerged as a crusade of groups or individuals formerly engaged in destructive practices and which have become conscience stricken or felt the pinch of dwindling resources and saw conservation as their only salvation. In a few cases it has been a fine vehicle for otherwise obscure individuals to ride to fame. Certainly more people have become attracted to it by what they could give than what they would receive in remuneration. Too often what has been "sauce for the goose failed to be sauce for the gander," and what was preached failed to be practiced.

We must undertake conservation of our natural resources for the sake of the resources and for the majority of the people, and we must use the selfish interests of groups and individuals only



The school garden offers a fine opportunity to bring good conservation practices to the attention of the younger pupils. Cleveland School Garden Photo.

HOW TO PLAN CONSERVATION PROJECTS

This is not too difficult if we begin with local problems and apply the same procedures that are used in solving similar problems in other fields. If the community needs tennis courts, a swimming pool, a recreation center, a new school, or a more efficient fire or police system, an interested group or an individual must first arouse interest in the project and demonstrate the need. Information concerning the probable use, and such items as the cost, and desirable location, must be obtained. This must be submitted to those in charge with a definite proposal or list of suggestions. Far-



Planting seedlings and sloping gully sides. For certain types of activities it may be necessary to divide the class into sections and take the groups out at different times.

sighted administrators usually have some plans formulated already and welcome lay support. So with the cooperation of the responsible officials, the majority of the people must be convinced of the importance of the project and must give an affirmative vote to authorize the cost.

Teachers should not let such opportunities pass by without student consideration of them. These projects, while not school sponsored, offer a challenge to any teacher to engage in some real constructive and worthwhile teaching. Conservation problems and projects offer as many opportunities for making teaching a living experience.

Here are some of the possibilities in the conservation field:

An adequate park system with nature trails, wildflower gardens, wildlife shelters and feeders, picnic areas, and hiking trails.

A town or school forest to demonstrate practical forestry methods and have a supply of lumber, Christmas trees, and fuel for the school.

A well-landscaped school yard which is attractive to birds and mammals for close observation.

A living nature museum, zoological or botanical garden to demonstrate proper care of plants and animals.

Attractive approaches to the town or city by auto and train where advertising is properly planned for the best appearance, and wildlife habitats are considered.

Wildlife sanctuaries with plants, birds, mammals, snakes, predators living together in their natural state.

Streams managed so as to be desirable places for plants, fish, birds, and bathers.

Fields tilled to keep the topsoil in place and in a fertile condition.

Lakes, seashores, and forests clean and available to the public and properly supervised.

Forests that are cut on a sustained yield basis.

Marine and aquatic resources harvested on a sustained yield basis.

Coal and oil mined and utilized efficiently.

Land generally utilized to its best advantage for stream and erosion control, forest or game production, for recreational or agricultural use.



A field study of erosion.

What town or city can say "We do not need natural resource planning" if confronted with a list of problems and possibilities such as that? What school administrator can dare say "That is not within our province?"

Just where do these things fit into our educational program, are they science,



Eight-year-olds look at their world.

civics, sociology, history, geography, biology, or community problems? No one of these subjects can encompass them all or provide the information required for a full understanding of the problems involved. ALL of these subjects have a direct bearing on them. Students must learn from their histories of our bountiful past and of our extravagant use and exploitation of our resources. From their science and biology they must know the nature of these resources, their present abundance or scarcity, and from their social sciences they must encounter the social barriers, the expense of counteracting self-interests, and the cost of resource planning, as well as the difficulties of administering the programs and of getting the people to use the resources and facilities wisely once provided.

Elementary school children must be introduced to these resources in an interesting way. They need not become too involved in the problems surrounding many of them, as this phase can be reserved for junior high or for high

school and college. The younger children must be taught to enjoy and respect the resources around them and this in itself is a real challenge for the first six or eight grades.

In high school and college these wholesome interests must be channelled into constructive projects where the students can feel the need for group and community action and support. They must begin to feel their places as citizens who will use these resources and be cheated if they or their children find the resources squandered, depleted, endangered, or unobtainable.

Through the schools we must interest the parents, the town fathers, and the citizens of the future in seeing that the community, the county, the state, the nation, and even the world is a healthy, prosperous, and a desirable place in which to live and to raise future generations of citizens.

SOURCE MATERIALS IN CONSERVATION

One of the barriers frequently cited to getting more teachers and adminis-

trators to sponsor conservation education programs has been the dearth of suitable texts and source materials.

However, as conservation education and resource planning have been gaining recognition, particularly during the last ten years, some states and numerous organizations and federal agencies have prepared guides, informational and curriculum bulletins for use in the schools.

These materials should aid considerably any teacher or school system interested in promoting a conservation program.

Year around state programs in conservation education have been prepared in Colorado, Georgia, Indiana, Kentucky, Michigan, Missouri, Ohio, Tennessee, West Virginia, Virginia, and Wisconsin; through the Department of Education or Public Instruction. New Jersey and New Hampshire, Massachusetts, Virginia, Washington, California, and several other states have specialized in conservation week programs.

In Kentucky, Michigan, Ohio, Tennessee, and West Virginia, the departments of conservation co-sponsored the preparation of the curriculum materials and aided financially through underwriting a part of all of the salaries of the specialists or supervisors who organized the program. In Missouri and Pennsylvania the conservation education efforts have been largely concentrated in the department of conservation or game commission. In Iowa, New York, and New Jersey the state colleges or universities have supplied most of the informational bulletins although the departments of education have been interested and cooperative.

The more recent and available publications from the states are listed in Part I of the accompanying materials list—Source Materials from States.

The Federal agencies which have prepared special conservation materials for

school and club use are: U. S. Office of Education, The Soil Conservation Service, U. S. Forest Service, and the U. S. Extension Service. Many of the resource bulletins by the U. S. Fish and Wildlife Service are also valuable for school use. The National Audubon Society, Garden Club of America, and National Wildlife Federation have prepared excellent guides, informational bulletins, and pictures. Guides for teachers giving sources of information and materials have been included in the *Journal of Geography*, *American Biology Teacher*, *American Nature Association Quarterly*, *Nature Magazine*, and *Audubon Magazine*. Some of these materials are listed in Part II—Source Materials from Federal and National Agencies.

PART I

Source Materials from States in Conservation Education and Resource Planning *California*

Department of Education, Sacramento
The Science Guide bulletins

1. Land Farms—February 1937 (Out of print)
2. Water, Its Conservation and Use—March 1937 (Out of print)
3. Soil, Its Use and Conservation—September 1938 (Out of print)
4. Insects, \$1.45
5. Birds, 25¢
6. Frogs and Toads, 25¢
7. Animal Studies, \$1.50.

Source Material for Conservation Week
Bulletin No. 1, 56 pp., 1936

Colorado

Department of Education

1. Conservation of Natural Resources, 136 pp.

Georgia

State Department of Education

1. Natural Resources of Georgia, 222 pp., 1937

Illinois

Illinois State Museum, Springfield

1. Illinois Mammals, Today and Yesterday, 40 pp., 15¢

2. Birds in Your Backyard, 240 pp., 1941, 60¢
Indiana
- Department of Public Instruction, Indianapolis
1. Conservation of Soils
 2. Conservation of Water, 48 pp., 1946
 3. Conservation of Plants (In preparation)
 4. Conservation of Wildlife (In preparation)
 5. Conservation of Fishes (In preparation)
- Iowa*
- Iowa Extension Service Ames, Iowa
1. Native Ferns of Iowa, Extension Circular 225, 52 pp., June 1936
 2. Upland Game Birds of Iowa, Extension Circular 228, 32 pp., June 1936
 3. Some Common Iowa Fishes, Extension Circular 225, 32 pp., June 1936
 4. Winter Birds Around My Home, Extension Circular 241, 32 pp., September 1937
 5. Nesting Birds of Iowa, Extension Circular 247, 64 pp., March 1938
 6. Fur Bearers and Game Mammals of Iowa, Bulletin P3, 32 pp., February 1940
- Kansas*
- State Teachers College, Emporia; Loren W. Mentzer, Wildlife Conservation
- Kentucky*
- Department of Education, Frankfort, Kentucky
1. Units in Conservation of Wildlife and Other Natural Resources, 275 pp., August 1941
- Michigan*
- Department of Public Instruction, Lansing
1. Learning to Conserve Natural Resources, Bulletin #322, 82 pp., 1942, 25¢
 2. Conservation Education in Michigan, Bulletin #3020, 25¢
- Department of Conservation, Lansing
1. Wildflowers of Michigan, 5¢
 2. Common Trees of Michigan, 10¢
 3. Michigan Rocks and Minerals, 25¢
- Missouri*
- Missouri Conservation Commission, Jefferson City
1. Conservation, Introduction, Vol. 1, 30 pp., 1940.
 2. Conservation, Soils, Vol. II, 32 pp., 1940
 3. Conservation, Water, Vol. III, 28 pp., 1941
 4. Conservation, Forestry, Vol. IV, 34 pp., 1941
 5. Conservation, Birds, Vol. V, 30 pp., 1941
 6. Conservation, Mammals, Vol. VI, 30 pp., 1941
- University of Missouri
1. Wildflowers of Missouri, Circular 363, 1937
- New Jersey*
- Agricultural Experiment Station, New Brunswick
1. Birds of New Jersey, 1928-1941 Bulletin Numbers 439, 470, 520, 531, 544, 553, 602 618, 640, 678, 690. (Birds grouped by families)
- Department of Public Instruction, Trenton
- Conservation Week in the Schools of New Jersey
1. The Preservation of Native Plants, 16 pp., 1937
 2. Defend New Jersey Soil, 16 pp., 1942
 3. Other Annual Bulletins
- New York*
- Department of Rural Education, Cornell University, Ithaca
- Cornell Rural School Leaflets, 32 pp., 50¢ per year, 4 numbers per year.
1. Conservation, January 1936
 2. Save the Soil, March 1936
 3. Are They Vermin, November 1937
 4. Nature Bibliography, September 1938
 5. Farm Forest Facts, November 1939
 6. Fields in Winter, January 1940
 7. Waterways in Spring, March 1940
 8. Holes in the Ground, November 1941
 9. Conservation Cartoons, September 1942
 10. Wild Foods, March 1943
 11. Cover, March 1945
 12. Outdoor Laboratories
 13. Hedgerows, November 1946
 14. Amphibia, March 1947
 15. Many other Nature numbers
- New Hampshire*
- State Board of Education, Concord
1. Conservation Week in the Schools of New Hampshire
 2. Annual Bulletins
- Ohio*
- Department of Education
1. The Teacher Looks at Conservation, 64 pp., 1940
 2. Conservation for Tomorrow's America, 144 pp., 1942, 50¢
- Pennsylvania*
- Pennsylvania Game Commission, Harrisburg
1. An Introduction to the Mammals of Pennsylvania, Bulletin 15, 10¢

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2. Pennsylvania Bird-Life, Bulletin No. 17, 68 pp., 1938, 10¢
3. Pennsylvania Wildlife, Bulletin No. 18, 48 pp., 1938, 25¢
4. More Food for Upland Game, Bulletin No. 11, 44 pp., Free
5. Wildlife in the Farm Program, Bulletin No. 16, Free
6. Special Wildlife Refuge Projects, Free
7. A Game Restoration Job for Everyone, Free

Tennessee

Department of Conservation, Nashville

1. Tennessee Wildlife, Bulletin No. 4, 43 pp., 1938, 20¢
2. The Natural Resources of Tennessee, 80 pp., 1939
3. Taking Conservation to the Schools, Bulletin No. 9, 1943
4. Wildlife Conservation in Tennessee, 18 pp., mimeo.
5. Birds of Tennessee in Verse and Story, 64 pp., 20¢
6. A Guide to the Fishes of Tennessee, 124 pp., 30¢
7. Forest Facts and Forest Trees of Tennessee, 64 pp., 5¢
8. Conservation Workbook for Women, 27 pp.

West Virginia

Department of Education, Charleston

1. Units in Conservation for West Virginia Public Schools, Vol. I, Elementary Grades 1-8, 120 pp., April 1939, 50¢
2. Units in Conservation for West Virginia Public Schools, Vol. II, Secondary Grades 7-12, 128 pp., April 1939, 50¢

Wisconsin

Department of Public Instruction, Madison

1. Teaching Conservation in Wisconsin Schools, Curr. Bull., Vol. I, No. 1, 72 pp., 1937
2. Helps in Teaching Conservation in Wisconsin Schools, Curr. Bull., Vol. I, No. 2, 102 pp., 1938
3. Helps in Planning Conservation Learning Experiences, Curr. Bull., Vol. I, No. 3, 58 pp., 1943

Department of Conservation, Madison

1. Programs and Projects for Junior Conservation Clubs, 28 pp., September 1942
2. Wisconsin Wild Flowers
3. Wisconsin Wild Life—Birds
4. Wisconsin Game Fish

Wisconsin Conservation League, Horicon

1. Conservation for Wisconsin Schools, The Soil, 36 pp., 1942
2. The Forests



PART II

Source Materials from Federal and National Agencies in Conservation Education and Resource Planning

THE AMERICAN BIOLOGY TEACHER, 403 California Ave., Royal Oak, Michigan, \$2.00 one year (monthly through the school year)

Conservation Series

1. Unit I, Seven Keys to Wildlife Conservation, December 1943
2. Unit II, Our Nation's Health Lies in the Soil, March 1944
3. Unit III, Conservation of Fishes, April 1944
4. Unit IV, Biology and Soils, May 1944
5. Unit V, Wild Flower Conservation, April 1945

Special Issue on Conservation, January 1943

American Nature Association, 1214 16th Street, Washington, D. C.

Quarterly Bulletin

1. Teaching Conservation, 32 pp., 25¢
2. Problems of Conservation, 32 pp., 1938, 25¢
3. Conservation Education Problems in Schools, 32 pp., 1938, 25¢

The Garden Club of America, 598 Madison Avenue, New York, N. Y.

1. Conservation Guide, 46 pp. (out of print)

Journal of Geography Magazine, 3333 Elston Ave., Chicago, Illinois, \$2.75 one year, 35¢ single copy

Six issues with Conservation Education emphasis

1. November 1942—Pictures, charts and posters
2. December 1942—Slides
3. January 1943—Film strips
4. February 1943—Objects, specimens, models
5. March 1943—Maps
6. April 1943—Motion pictures

National Audubon Society, 1006 Fifth Avenue, New York, N. Y.

Educational Leaflets

1. Bird Study for Camps, No. 21
2. Bird Houses, No. 29
3. Bird Day, No. 30
4. Electric Nature Games, No. 34
5. An Owl Study Program
6. How Should Nature Be Taught, No. 35
7. Soil—How Wildlife Depends Upon It, No. 36
8. Water—Life Blood of the Earth, No. 37
9. Swamps and Marshes, No. 38
10. Forests, No. 39
11. Grasslands, No. 40
12. Nature Trails
13. Small Nature Museums
14. Building a Nature Interest
15. Nature Photography

Teachers Guide—A Source Book for Advisors of Audubon Junior Clubs, 92 pp., 1944, \$1.00

School Nature League Bulletins, 10 issues per year, \$1.00. Many nature subjects

National Education Association, Department of Rural Education, Washington, D. C.

1. Conservation Education in Rural Schools, 1943 yearbook, 50¢

National Wildlife Federation, Washington, D. C.

My Land and Your Land Conservation Series

1. Would You Like to Have Lived When? Grades 3, 4 and 5, 32 pp., 1941
2. Raindrops and Muddy Rivers, Grades 4, 5 and 6, 32 pp., 1941
3. Plants and Animals Live Together, Grades 5, 6 and 7, 48 pp., 1942
4. Nature's Bank—the Soil, Grades 6, 7 and 8, 48 pp., 1942

United States Office of Education, Washington, D. C.

1. Conservation in the Education Program, Bull. No. 4, 78 pp., 1937
2. Teaching Conservation in Elementary Schools, Bull. No. 14, 125 pp., 1938
3. Conservation Excursions, Bull. No. 13, 106 pp., 1939, 15¢
4. Curriculum Content in Conservation for Elementary Schools, Bull. No. 14, 80 pp., 1939
5. Opportunities for the Preparation of Teachers in Conservation Education, Pamphlet No. 90, 20 pp., 1941
6. Conservation Films in Elementary Schools, Bulletin No. 4, 38 pp., 1941
7. Choose a Book About Things to Be Conserved, Leaflet No. 60, 20 pp., 1941

8. Conservation Bibliographies, Good References series, Nos. 55, 70, 71, 72
9. Conserving Farm Lands, Vocational Division Bull. No. 201, 104 pp., 1939

U. S. Extension Service, Washington, D. C.

1. Teaching Conservation of Wildlife Through 4-H Clubs, 34 pp., 1938, 10¢ (U. S. Gov't Printing Office)
2. Forestry for 4-H Clubs, 50 pp., 1941, 10¢ (U. S. Gov't Printing Office)

U. S. Forest Service, Washington, D. C.

1. Forest Conservation—Packet (Selected Publications of the Forest Service for Schools and Libraries—U. S. Gov't Printing Office)
2. Conservation Workshops—Regional Office, Phila., Pa.

U. S. Soil Conservation Service, Region 1, Upper Darby, Pa.

1. Teaching Materials in Soil Science for General Science, Biology, Physics and Chemistry classes, 11 pp., mimeo, Free
2. Getting Acquainted with the Soil, 13 pp., mimeo, Free
3. Outline Soil Erosion, Soil Conservation and Water Conservation, 12 pp., mimeo, Free
4. Soil Conservation and the Public Schools, 5 pp., mimeo, Free
5. Bibliography, 3 pp.
6. Film sources, 2 pp.
7. Some References for Teachers on Soil Conservation and Land Use, Division of Information SCS B-2, March 1940 (4147), 8 pp., mimeo., Free
8. Numerous other publications and bibliographies available upon request

EDITOR'S NOTE: This is a renewal of a series of units started two years ago by the conservation committee under the leadership of Chairman E. Laurence Palmer. The previous units were:

I. *Seven Keys to Wildlife Conservation*, E. Laurence Palmer.

II. *Our Nation's Health Lies in the Soil*, Ollie E. Fink.

III. *Conservation of Fishes*, Howard H. Michaud.

IV. *Biology and the Soils*, F. Olin Capps.

V. *Wild Flower Conservation*, P. L. Ricker.

All of these have been placed in the middle of the magazine in 8-page sections which may be removed without disturbing the remainder of the contents. Units dealing with insects and with vertebrates are tentatively under way. Suggestions for future units or for authors and organizations who might contribute future units are in order.