Natural Area Programs

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ABSTRACT–Efforts of public and private organizations to preserve undisturbed areas for scientific or educational uses are recognized on state, regional, national, and international levels. A plea is made for coordinated prompt action to inventory and set aside additional natural areas.

Preservation of natural areas is a popular goal today, and motives and programs for recognizing and setting aside such areas are at least as varied as the agencies and organizations involved. One group may define a natural area as a greenbelt or a recreational area with bicycle and foot trails, whereas the other extreme will consider it a truly pristine and unique ecosystem, never disturbed by man, and with entry strictly regulated and enforced. The number of natural area programs and the diversity of sponsors indicate broad and deep interest.

This discussion, however, is limited to major current programs with scientific and educational objectives. The typical park programs found in every state are excluded, along with many other worthwhile efforts that are primarily recreation-oriented. Similarly excluded are the few programs dedicated to saving only the extremely rare and unique vegetation types or habitats of endangered animals. Our working definition is that adopted by the Society of American Foresters:

> **. . . a physical and biological unit in as near a natural condition as possible which exemplifies typical or unique vegetation and associated biotic, edaphic, geologic and aquatic features. The unit is maintained in a natural condition by allowing physical and biological processes to operate, usually without direct human intervention.**

Professional Programs

Society of American Foresters—SAF had the first professional society program in natural areas, begun in 1947 and led by men such as John F. Shanklin, C. H. Coulter, L. I. Barrett, A. F. Hough, Jesse Buell, C. F. Brockman, R. D. Forbes, and S. O. Heiberg. In 1949, the *Journal of Forestry* listed the 68 areas then set aside on public and private lands. These ranks have now swelled to 281 areas. They are described in "Natural Areas of the Society of American Foresters" (February 1973). SAF Forest Cover Types, although better adapted to characterization of typical rather than unique forest conditions, nevertheless have proved a useful tool in the description of and search for Society-recognized areas.

In 1946, to give this program continuity and direction, the Society accepted a suggestion of Svend Heiberg to establish a National Committee on Natural Areas. The first chairman was John Shanklin; the second, Donald Lynch. The committee functions through regional SAF Sections and Section natural area liaison officers who relate national goals and policies to local situations. Sections nominate areas to the committee after securing landowner agreement to protect and preserve the areas. Upon approval, SAF officially recognizes and lists these dedicated Natural Areas. Permission for scientific study of the area should be secured from the Society and the landowner. Recognition is withdrawn if the landowner so requests or if the vegetation is altered so as to negate the value of the tract as a natural area.

Society for Range Management—Under the direction of its national Rangeland Reference Area Committee, the SRM recognizes four kinds of special areas: *Research Natural Areas, (RNA) managed range study areas, exclosures,* and *other reference areas*. The first category is for large "baseline" or "check" areas representative of original vegetation. They receive nondestructive or nonconsumptive management, in which grazing is generally prohibited except to simulate grazing by large natural herbivores such as bison. This category is analogous to the SAF natural area concept.

The SRM effort began in 1966 under the guidance of the first Rangeland Reference Area Committee chairman, E. William Anderson. SRM recommends

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that establishment of managed range study areas be coordinated with the Soil Conservation Society of America. Like SAF, SRM functions through regional sections to identify and preserve the rangeland areas. The various rangeland reference area programs are detailed by the current committee chairman, William Laycock, in an SRM Range Science Series publication in press.

Soil Conservation Society of America—This society has a managed natural area program intended to illustrate the values of natural vegetation in conservation work, landscaping, beautification, recreation, and environmental improvement. Tracts used for forestry, grazing, wildlife, recreation, watershed protection, or scientific study are included in the program directed by the SCSA Natural Vegetation Subcommittee of the Plant Resource Conservation Division. An essential criterion is that the plant communities be dominated by native species characteristic of the local soil and climate. Some of these areas, even those being grazed, might well meet the SAF definition for a natural area.

A recent census of SCSA-managed natural areas counted 46, ranging from 12 acres of virgin chestnut soil lands, never grazed, in North Dakota to the 70,401-acre Valentine National Wildlife Refuge in Nebraska. Local chapters of the SCSA nominate candidate areas to regional and national Natural Vegetation Committees. Accepted areas are then certified by the Society.

Historical Perspective

Possibly the first to promote the concept that leaving land in primitive condition had values in recreation, wildlife, and watershed management as well as research was Aldo Leopold. Between 1920 and 1924, he and his Forest Service associates were instrumental in keeping undisturbed large forest areas in Colorado and New Mexico.

The 1922 *Journal of Forestry* article by W. W. Ashe, "Reserved Areas of Principal Forest Types as a Guide in Developing an American Silviculture," was also a landmark. Here, half a century ago, a forester foresaw the practical use and value of reserved areas typical of major forest conditions as a check or reference against which to compare management results.[1]

Although SAF, SRM, and SCSA are the only professional resource management societies which have natural area programs, it is important to recognize the early efforts of the Ecological Society of America. In 1917, it set up a 25-man Committee on the Preservation of Natural Conditions to list all preserved and preservable areas in North America in which natural conditions persisted. The group was chaired by Victor Shelford and supported by the National Research Council, the Forest Service, and various public agencies, professional societies, colleges, and universities. After seven years' work, the committee produced the *Naturalists' Guide to the Americas*. Published in 1926, this famous book set the stage for the American natural area movement.

[1]See also John Shanklin's November 1968 article in the *Journal of Forestry*, "Natural Area Project—An Historical Review of the Activities and Accomplishments of the Committee on Natural Areas."

Shelford's publication was succeeded in 1950 by S. Charles Kendeigh's "Nature Sanctuaries in the United States and Canada . . . A Preliminary Inventory." This list of 691 nature sanctuaries, published in *The Living Wilderness* magazine, was prepared for the Ecological Society of America and The Ecologists Union (which became The Nature Conservancy in 1950).

The American Association for the Advancement of Science followed these reports in 1963 with "Natural Areas as Research Facilities." This comprehensive study called for an enlarged and better coordinated natural area program, citing some 2,400 scientific papers based on research performed all or in part on natural areas.

Federal Agency Programs

Forest Service—Forest Service scientists and naturalists were some of the earliest proponents of the natural area concept. Besides the support provided Shelford, the Forest Service was the first U.S. agency to create a system of Research Natural Areas. The Santa Catalina area on the Coronado National Forest in Arizona was established March 23, 1927!

The agency's objective is to represent as many of the major natural timber types or other plant communities as possible, as well as special forest or range conditions such as outliers of grass or timber types, unique bog associations, or unusual combinations of flora. In May 1973, the agency dedicated its 100th area—the northernmost grove of coastal redwoods near Brookings, Oregon. Currently, Forest Service Research Natural Areas number 110 in 29 states and Puerto Rico; they total some 120,000 acres. Although the areas are administered and protected by the National Forest System, permission for scientific use of the area must be secured from the director of the appropriate Forest and Range Experiment Station.

Research Natural Areas may also be located in Wilderness Areas since by law (the 1964 Wilderness Act) these areas are "devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use."

U.S. Army Corps of Engineers—Four regional pilot programs were begun in 1972 in Vermont, Washington, North Carolina, and South Carolina to evaluate features of physical, biological, or cultural importance. To aid this evaluation, the Smithsonian Institution has contracted to review all available environmental inventories, list sources of environmental resource data, review evaluation systems, and assess use of computers. Although the objectives of this program are broad, some areas will be of primary value as undisturbed biological units.

National Park Service—Besides cooperating with the Federal Committee on Research Natural Areas, NPS has a Natural Landmarks Program. Its four objectives are:

(1) To encourage the preservation of sites illustrating the geological and ecological character of the United States.

(2) To enhance the educational and scientific value of sites thus preserved.

(3) To strengthen cultural appreciation of natural history.

(4) To foster a greater concern in the conservation of the nation's natural heritage.

Suitable land, whether publicly or privately owned, can be designated as a Registered Natural Landmark by the Secretary of the Department of the Interior. Selection criteria, broader than for a natural biological unit, are based on geologic or ecologic themes and so may also include geologic formations, fossil beds or other archaeological sites, "seasonal havens for concentrations of native animals," or examples of scenic grandeur.

National Science Foundation—As a highly significant contribution toward the goals of the Conservation of Ecosystems section of the International Biological Program, NSF has funded an inventory of nonfederally owned natural areas. Six categories grade from light to intense human use: ecological research area; manipulative research area; educational area; endangered species preserve; botanical, geological, and archaeological areas; and recreational areas.

A state-by-state survey is being organized with the aid of local scientists and the cooperation of the American Institute of Biological Sciences. Aquatic, terrestrial, and marine areas are included. At last count, some 2,500 areas had been considered from an estimated total population of 7,000. Perhaps 700 qualify as natural areas of scientific value.

Federal Committee on Research Natural Areas—Federal interests in preserving the natural environment took a strong upswing in the 1960's—witness the Wilderness Act of 1964 and the Land and Water Conservation Fund of 1965; the 1968 report of the President's Scientific Advisory Committee on Environmental Pollution; the National Environmental Policy Act of 1969 (which acknowledges the need to ". . . preserve important historic, cultural, and natural aspects of our national heritage. . . ."); the report of the Public Land Law Review Commission; and creation of the President's Council on Environmental Quality.

The beginning of the International Biological Program, the appointment of Stanley Cain as Assistant Secretary for Parks and Refuges in the U.S. Department of the Interior, and the obvious merits of a coordinated program, led to establishment of the Federal Committee on Research Natural Areas in 1966. The most active participants were the National Park Service, Bureau of Land Management, Bureau of Sport Fisheries and Wildlife, and Forest Service. Supporting agencies were Agricultural Research Service, Soil Conservation Service, Atomic Energy Commission, National Science Foundation, Cooperative State Research Service, Department of Defense, Council on Environmental Quality, The Nature Conservancy, and Smithsonian Institution.

In 1968, the FCRNA issued a directory of 336 Federal Research Natural Areas. Its last project was an interagency policy and management document titled "Standards and Policy Guidelines for Research Natural Areas." Although the Federal Committee ceased to exist in 1972, efforts are underway to recon-

Left, *Lewisia rediviva* growing on the lithosolic soils of the Rattlesnake Hills RNA, a 75,000-acre tract managed for the Atomic Energy Commission by Battelle Northwest Laboratories as part of their Arid Lands Ecology project. Located in the arid interior of southeastern Washington, the RNA represents shrub-steppe vegetation. Photo courtesy Battelle Northwest-O'Farrell.

stitute a similar group, with membership broadened beyond the federal agencies, and identified as a formal committee of the Council on Environmental Quality. The four core agencies of the FCRNA are continuing their individual natural area programs.

Other National Programs

The Nature Conservancy—This publicly supported national conservation organizationn is dedicated to the preservation of ecologically and environmentally significant terrestrial and aquatic areas. The organization protects threatened natural areas by purchasing them with publicly subscribed funds, by accepting donated lands, or by advance acquisition of lands for local, state, and federal agencies. Some 377,055 acres of forests, swamps, marshes, prairies, mountains, beaches, and islands in 972 projects throughout the United States have been saved by The Nature Conservancy since acquisition of its first preserve in 1954.

It has also helped coordinate natural area programs of various other groups and kindle interest in the concept. Through creation of the post of science advisor, and later, vice president for science, The Conservancy recently has increased its searches for preservable areas of significant scientific value.

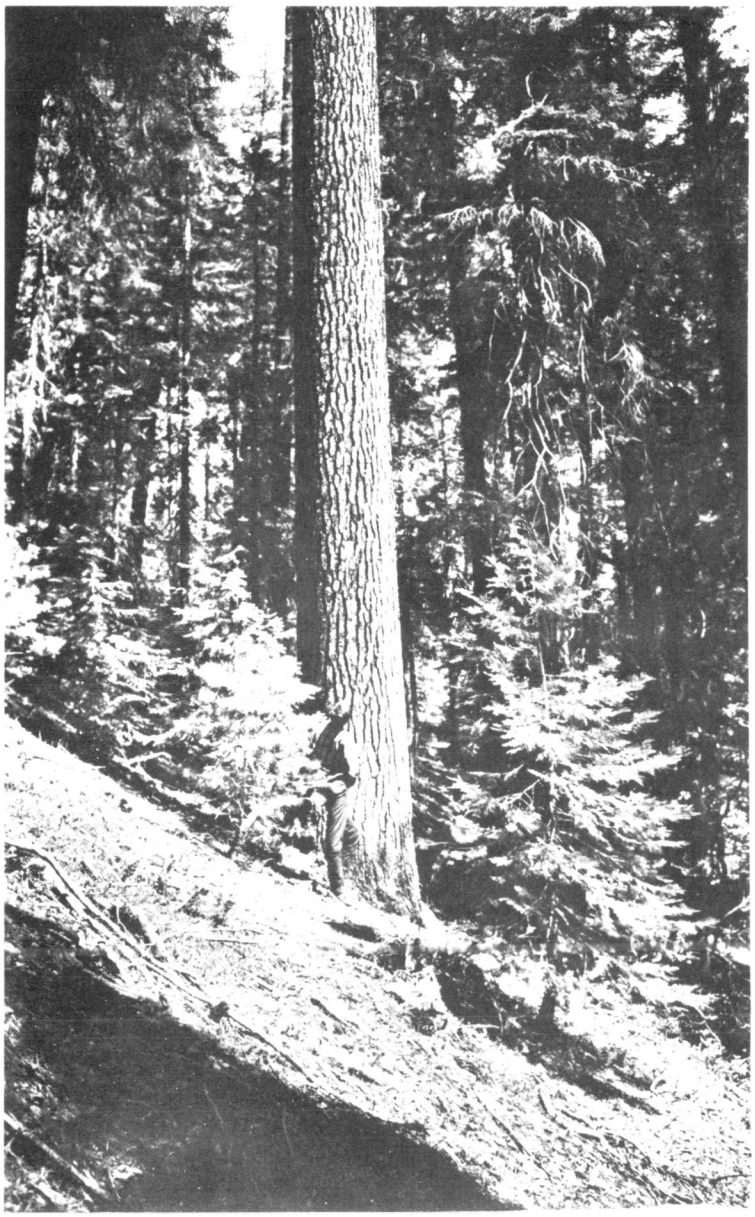
The Smithsonian Institution—Recently, the Smithsonian's Department of Ecology established a Center for Natural Areas, concerned with various aspects of natural areas, including both domestic and foreign inventories. With the aid of a small staff and in cooperation with The Nature Conservancy, plans are underway for a national inventory and register, the National Registry of Ecosystem Preserves. A *single* listing of all the information on U.S. natural areas and natural area programs would be most useful in many phases of the preservation effort. With a computerized data storage and retrieval system, both presently protected and prospective areas would be included. Information could be manipulated and presented in various ways. It is this center that is cooperating with the Corps of Engineers in an analysis of the corps' environmental resource inventory to ascertain the state of the art in collection, evaluation, storage, and display of environmental data.

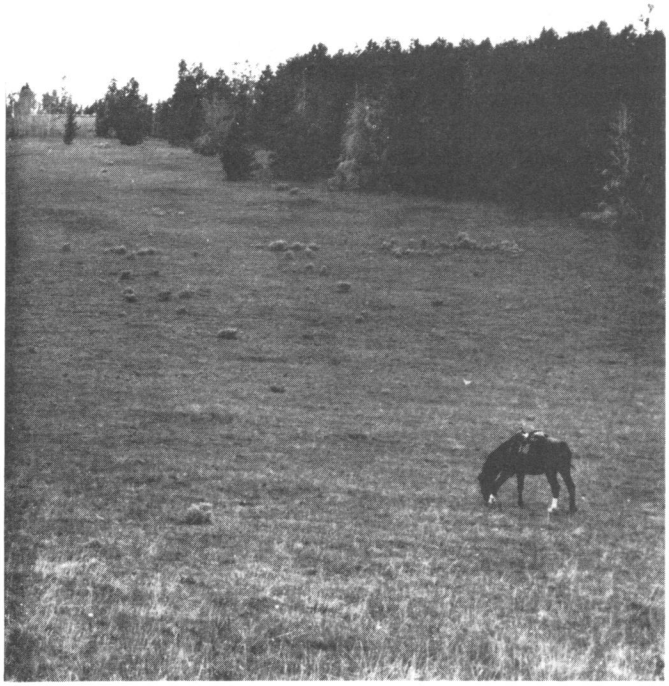
State Programs

Several states have set aside undisturbed study areas. Some of these programs are quite elaborate and active; others have barely taken form. According to National Science Foundation-funded scientists, six states have good natural area systems and records, 10 plan to develop data banks or similar reference centers, 10 have created working committees to study the problems, 12 are showing preliminary interest, and others are "essentially unorganized with respect to research natural areas."

One of the oldest and most comprehensive state programs is that of the Illinois Nature Preserves Commission and Natural History Survey. Illinois has 44 natural areas totaling 13,465 acres, although not all may meet SAF criteria. Also well established is the program created by an act of the Indiana General Assembly; the state's Division of Nature Preserves lists 20 Nature Preserves, plus other kinds of natural areas. Other effective state programs include the

Below, typical old-growth specimen of sugar pine, Abbott Creek RNA in southwestern Oregon, Rogue River National Forest. This 2,660-acre area was established in 1946 to exemplify Oregon's Sierra-type mixed conifer forests. U.S. Forest Service photo.





Left, grasses, sagebrush, lodgepole pine, and aspen on the 2,300-acre Cliff Lake RNA on the Beaverhead National Forest, Montana. U. S. Forest Service photo.

Below, typical western juniper woodland, Horse Ridge RNA administered by the Bureau of Land Management in central Oregon. The 600-acre area is a unique juniper/big sagebrush/threadleaf sedge community in near pristine condition. U. S. Forest Service photo.

Left, tropical rain palm forest of the Baño de Oro Research Natural Area of the Caribbean National Forest, Puerto Rico. U.S. Forest Service photo.

Below, the 2,113-acre Tionesta RNA on the Allegheny National Forest in Pennsylvania was established in 1940. Eastern hemlock, beech, birch, sugar maple, and cherry flourish on this typical northern hardwoods-hemlock area. U.S. Forest Service photo.

University of California's Natural Land and Water Reserves System, the Michigan Natural Areas Council, and Washington's Intercampus Committee on Educational and Scientific Preserves. In 1951, Wisconsin established a Board for the Preservation of Scientific Areas, and recently the state's Scientific Areas Preservation Council listed 78 areas preserved for botanical, zoological, geological, or archaeological purposes. Similar categories are recognized by the Georgia Heritage Trust Advisory Commission established in 1972.

Northeastern states launched a regional project in 1970: the New England Natural Resources Center. It recently completed, with funds from the New England Regional Commission, an inventory of 4,000 natural areas meriting protection. Current work seeks to devise and implement protection programs in each state while providing ". . . a regional focal point for environmental and natural resources concerns."

International Efforts

Nationally focused efforts, such as the U.S. programs, cannot function independently from similarly motivated international efforts. Throughout the world the desire to protect man's environment and the concept of preserved natural areas are gaining support.

A major contribution is being made by the International Biological Program, a worldwide attempt by biologists to study, understand, and preserve ecosystems, and to learn more about how man and nature interact. An international inventory of natural preserves is being compiled by the Conservation of Terrestrial Communities (CT) section of IBP; its aim is to enumerate the ecological and biological characteristics of each natural preserve identified.

In America, this assignment is handled by the Conservation of Ecosystems section of the U.S. IBP Committee. Detailed checksheets on the flora, fauna, geology, and other characteristics of each area are sent to the IBP computer data bank at Monks Wood Experimental Station in England. All U.S. federal agencies have been asked to submit checksheets on their Research Natural Areas. Although IBP will probably end in 1975, efforts are underway to continue part of the program.

A second important international effort was started at the 1972 United Nations Conference on the Human Environment in Stockholm. One portion of the U.S. Basic Paper to this conference stressed the need for natural areas as a way to monitor changes in the environment. Of major importance was conference approval of the "Earthwatch" program—a coordinated plan to use and expand existing monitoring systems to measure pollution levels around the world. A second major accomplishment was endorsement of the World Heritage Trust Convention, which states that some areas of the world are of such unique natural, historical, or cultural value that they are part of the heritage of all mankind and should therefore be accorded special recognition and protection.

The Institute of Ecology (TIE), formed with the encouragement of the Ecological Society of America, and sponsored by many scientific and educational organizations in the Americas, addresses environmental problems too large to be tackled by single universities or organizations or even by single nations. As TIE gains in staffing, funding, and experience, it may provide international data storage and retrieval systems that would make it a clearinghouse for natural area efforts.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO)-proposed program called Man and the Biosphere would "Develop a global program to inventory and assess the resources of the biosphere, including systematic observations and monitoring and research into the structure and functioning of terrestrial and aquatic ecosystems and research into changes in the biosphere brought about by man and the effects of these changes on men."

The International Union for the Conservation of Nature and Natural Resources (IUCN) supports a program called the Endangered Ecosystem Monitoring Program, intended to monitor populations of endangered flora, fauna, and ecosystems, and to record environmental information on unique ecosystems. IUCN has also worked with other groups to develop an international system of national parks and preserves and to provide management and protection guidelines.

Many other countries, including Great Britain, Russia, Czechoslovakia, Tanzania, India, Argentina, and East Germany, have natural area programs. Canada, working mainly through the Canadian IBP committee, has given major emphasis to locating and describing tracts. The Nature Conservancy of Canada has inventoried nearly 100 areas, mostly in eastern or central Canada. British Columbia and Alberta have been leaders in the establishment of natural areas or ecological reserves. The Canadian Institute of Forestry has created a national natural areas committee chaired by Gordon F. Weetman with goals and a national registration plan much like those of the SAF.[2]

Fill in the Gaps

Considering all the on-going programs, there seems to be a major need to incorporate areas and conditions now represented either poorly or not at all. Lands in the central, northern, and southeastern states and at low elevations in the West are generally those least represented. Yet here, where man's influence has been most active, the need for a comparison of the undisturbed environment with the present one is very important. Most of these lands are in state and private ownership. Also poorly represented are the less common vegetation types, and mosaics of different types.

The second major need is for a single coordinated inventory of national needs and of types or conditions already adequately protected. Such an inventory will become increasingly essential as a guide to identifying the areas or conditions not now protected, including those mentioned in the preceding paragraph. The key word is coordination. With coordination, we can avoid the unlikely possibility of duplication of effort. More importantly, we can move quickly to fill gaps in a national system of natural areas before certain conditions are lost forever. □

[2]Canadian activities are detailed in the April 1973 issue of the *Forestry Chronicle*.

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