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Natural Area Conservation in Iowa

S. GALEN SMITH¹

Abstract. Natural areas are being rapidly destroyed throughout the world and especially in Iowa with its intensive agriculture. Natural areas are valuable as sources of research materials, for documentation of accomplished research, for teaching, and for recreation. Through cooperative action between public and private organizations, many natural areas have been preserved in Iowa. However, recreational and other use of these areas may destroy their natural values. It is important that many more natural areas be preserved by such organizations as The Nature Conservancy as well as the state. Of particular value are teaching and research areas near schools, unusual habitats with rare species, and prairie remnants along railroad rights-of-way.

A Natural area may be defined as a piece of land in which only "natural", *i.e.* non-human, forces are at work. Under this definition are included both primeval areas never appreciably disturbed by man, and areas which have been disturbed in varying degrees but are now protected from disturbance. Each kind of area has value as a natural area, but undisturbed habitats are by far the most valuable because they are irreplaceable once they are destroyed.

As human populations have grown and technological knowledge increased, man has used his ability to modify environment so extensively and intensively that only small areas of the earth's land surface remain unchanged. The change caused by man is proceeding at an accelerating pace today and shows no signs of slowing down. In Iowa, blessed with an unusually favorable combination of climate, topography, geological history, and soils, over 95% of the land is either cultivated or grazed. The originally delicately-balanced native ecosystems have been replaced by new ones dominated by agricultural practices of man. Only tiny remnants of the formerly vast prairies, woods, and wetlands, evolved over thousands of years under natural forces, have escaped destruction during the short period of 150 years. With these remnants are preserved small samples of most of the marvelously rich native flora and fauna which evolved as integral parts of the natural areas they inhabit.

WHY PRESERVE NATURAL AREAS?

Natural areas represent enormously complex ecosystems which cannot be duplicated by man and will probably never be completely understood. Biologists have hardly begun even to des-

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cribe the gross features of the structure and genesis of prairie and other vegetation types and the soils they have helped to develop. Man has not even formulated many of the problems awaiting investigation in these natural areas. Such elementary first steps as the making of species lists have not yet been taken for many areas, and unique areas have often been destroyed before biologists even knew what organisms lived in them. Natural areas are a vast storehouse of potential information in such fields as soil genesis, soil microbiology, plant and animal ecology, genetics of natural populations, natural selection, plant and animal taxonomy, and as many other fields as one wishes to list. The biological problems which await investigation involve all levels of biological organization from intracellular biochemistry to the dynamics of biotic communities. If there is any value to scientific investigation, it is folly for society to fail to conserve the sources for such a wealth of potential knowledge as lies in the remaining undisturbed areas.

In addition, natural areas are living museums for the documentation of accomplished scientific work. Many kinds of investigations can and should be documented by preservation of the study areas so future scientists and students may re-study the same problems in the same natural settings, check the original work, and build further research upon it. An example in plant taxonomy is the preservation of populations of plants upon which a study of natural variation has been based.

Closely related to scientific investigation is teaching. Students are learning to be scientists or to interpret scientific knowledge for society. At all levels, from pre-school ages to college graduates, the student should experience and study natural areas in addition to agricultural areas as an integral part of his study of biology and the natural world around him. Then, perhaps, as Paul Sears said in an essay on biology teaching, he "will come to realize how changes produced by man, in destroying forests, prairies, and wild life, have in turn reacted upon his social life. . . . He will understand the natural community, not merely as an outworn curiosity, but as in many respects the model for his own communities in the future." Natural areas are therefore vitally important parts of the teaching facilities of a school. Every school, from grammar school to university, should have available at least one natural area, preferably within walking distance so that classes can easily visit it during one class period.

Recreational use of natural areas in our parks and recreation areas is heavy and rapidly increasing. This is a generally recognized value of such areas, and it is therefore not a primary purpose of this paper to discuss it except in regard to conflicting uses as cited below.

PAST NATURAL AREA CONSERVATION

Much has already been accomplished in Iowa by hard work of dedicated people. Action by several state and federal agencies, including the Iowa Conservation Commission, the U.S. Fish and Wildlife Service, and the Soil Conservation Service, has resulted in excellent progress in many fields. The inspiring and comprehensive "Iowa 25-year Plan", drawn up in 1933 by the Iowa Board of Conservation and the Iowa Fish and Game Commission, guided conservationists well for that period of time. The Iowa Academy of Science, through its Conservation Committee, has been a strong force in the conservation movement since about 1914 (Aikman, 1949). To date, about 100 areas have been preserved as state parks, preserves, forest areas, and recreation areas. In addition are many wildlife refuges, public shooting grounds, and county and city parks. An outstanding accomplishment is the establishment of four prairie preserves, totaling about 400 acres. This project was part of the "25-year Plan" and was worked out in detail in the early 1940's (Hayden 1944) by the Conservation Committee of the Iowa Academy of Science while Dr. John Aikman was chairman. Several private organizations, including the Izaak Walton League and local garden clubs have helped to preserve many small areas. The latest organization to contribute to natural area conservation in Iowa appears to be the Nature Conservancy, which recently acquired by gift a particularly fine tract of native woodland near Simpson College in Indianola.

Many of the existing publicly-owned parks, preserves, and other types of areas are entirely or in part natural areas. They effectively preserve samples of most of the vegetation types and their soils. This is especially true of the state prairie preserves, Woodman Hollow, and several state and national forest areas.

Recreational and other use of these areas sometimes is incompatible with natural area preservation. Trampling and cutting of firewood seriously disturbs large parts of some of the more heavily-used parks such as the Ledges near Boone. The 1957 report of the Conservation Committee of the Iowa Academy states: "The tremendous overuse in some areas has destroyed the natural vegetation causing the state parks to lose their identity as such." A particularly serious case is the damage due to visitors to the unique *Sphagnum* bog at Pilot Knob State Park. The ski runs and tow presently being constructed at the same park is another example. A third example is the nearly complete destruction of the dry prairie which formerly inhabited the top of Pilot Mound, Boone County. A different kind of damage to a natural area is the flooding to create a lake, as was done at Springbrook, thereby destroying what was probably a unique flora and fauna associated with a deep valley and many springs.

Such conflict between different uses of an area is often inevitable. It seems clear, therefore, that more areas of particular biological value should be set aside as natural area preserves for scientific study and teaching. These areas may be used as recreational areas only if this use does not destroy their essential value as nature preserves.

FUTURE ACTION

Efforts of the Iowa Academy of Science through its Conservation Committee, in cooperation with the Iowa Conservation Commission, should be continued. A new survey of areas worthy of protection as natural areas should be made, and areas already so identified should be further investigated. As many as possible of these should be preserved as soon as feasible. A great amount of information about such areas already exists. This is especially true of the prairie described by Ada Hayden in the 1944 report of the Conservation Committee. Other areas have been described in the literature or in biologists' notebooks. Such a survey was begun by the Biological Survey Committee of the Iowa Academy (1956 Report). To preserve additional natural areas, the aid of private organizations and non-biologists should be enlisted as much as possible. A prime example is the work of the Advisory Coordinating Committee, in which a psychologist, a chemist and people in other fields greatly aided the Conservation Committee in about 1947-8 (Report of the Conservation Committee, 1948 and Lovell, 1949). There is obviously considerable untapped interest in the conservation of natural areas among both academic non-biologists and the non-academic community.

The ideal organization through which to work for natural area preservation would seem to be The Nature Conservancy. Its primary objectives are nature conservation and education, and it has been remarkably successful in other parts of the country (Goodwin, 1961). An Iowa Chapter is being organized today in Ames by a group of charter members from all walks of life and all parts of the state.

Particular attention should perhaps be paid to the following types of areas:

- 1) Teaching and research areas. These should be located, if possible, near campuses of educational institutions. Ideally, each college and university with a strong biology program should own, or have readily available as outdoor teaching laboratories, several natural areas illustrating the major habitat and soil types found in the vicinity. These should include prairie, woods, and wetlands, preferably several types of each. Special attention should be paid to campuses, such as Iowa Lakeside Laboratory, where field courses are taught in the summer. Many of the

natural areas indispensable to teaching at these campuses are not protected and are one-by-one being destroyed.

The practice of obtaining natural areas is well established at many colleges and universities outside of Iowa. A preliminary "Survey of College Natural Areas" (Dowling and Goodwin, 1962), prepared by The Nature Conservancy in connection with the conference on College Natural Areas at Allerton Park, University of Illinois, in May 1962, lists 75 such areas in 29 states. One of these areas covers 23,000 acres. Iowa is not listed in this survey, in spite of its excellent conservation record.

A few schools are extremely fortunate in having fine natural areas on their campuses. One example is Pammel Woods on the Iowa State University campus. This area was set aside "for forestry and park purposes" by the Board of the Iowa State Agricultural College in 1894-5, and was dedicated to the pioneer Iowa botanist and Conservationist, Louis H. Pammel, in 1941. It has long been an invaluable area for teaching in many courses in botany, zoology, and other life sciences. Another area is a fragment of excellent upland prairie on the south edge of the grounds of the new Ames High School. Both these areas are constantly threatened by expansion of the schools and the community. It is essential that school officials understand that these areas are natural areas valuable in teaching and research and not just waste land, and that they be set aside as inviolate natural areas.

2) Unusual habitats in which rare or unusual plants and animals live. Examples of such areas already preserved are Silver Lake Fen in Dickinson County, Pilot Knob in Hancock County, and White Pine Hollow in Dubuque County. Wetland communities which were formerly rather abundant but now very rare in Iowa are bogs of various types, especially peat bogs with a flora rich in Arctic-boreal species. Preservation of several such areas would be extremely valuable.

3) Additional prairie, woodland, and marsh. Many existing natural areas are relatively small and are located on odd corners of farms or public property. They often may be acquired by gift or purchased for small prices by local communities. Such areas, where possible, should be identified and set aside before pressure to develop them arises.

Particularly important natural areas in Iowa are the prairie strips along railroads, usually between them and roads. These areas are scattered widely throughout Iowa and often add greatly to the beauty of the roadside. A common practice of the railroads is to allow the neighboring farmers to cultivate or graze these strips, and several very good natural areas have been

plowed in the past year. One such area, long used by biologists at Ames, lies between the Chicago and Northwestern Railroad and Highway 30 east of Boone. Negotiations for preserving it by agreement with the railroad and the State are in progress. Many other fine areas of this type might well be preserved in the same way, perhaps with an option to buy if the railroad discontinues its line. Cooperation of this kind, between public and private organizations and individuals, can lead to the preservation of many more valuable natural areas in Iowa.

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Notes on the Biology of the Jackrabbit in Iowa

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Abstract. White-tailed jackrabbits, *Lepus townsendii campeanius* Hollister, are found throughout Iowa with the exception of a few southeastern counties. Over much of their range they are relatively rare. They appear in greatest abundance on the recently glaciated soils in northern and central counties, and on the Missouri loess soils of the west-central counties. Dry growing seasons seem conducive to hare abundance; populations decline during wet seasons. Jackrabbits provide considerable hunting sport during winter. Their pelts are utilized in felt manufacture and their flesh as a staple food for ranch mink. They are known to eat sprouting corn and soybeans, and occasionally damage shrubs and trees. High populations of 114 and 90 jacks per square mile are recorded here. High populations of near 30 jacks per square mile are more common. Average populations over the more favorable portions of their range seem to fall between 5 and 15 per square mile. Average winter weights of 7.5 and 7.9 pounds for males and females respectively are recorded. These contrast with spring weights of 6.8 and 8.3. Sex ratios are essen-

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