

1968

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Recommended Citation

Marshall, W. H. (1968). The Cedar Creek Natural History Area: A Progress Report. *Journal of the Minnesota Academy of Science*, Vol. 35 No. 1, 57-61.

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The Cedar Creek Natural History Area: A Progress Report

WILLIAM H. MARSHALL *

ABSTRACT— During the past five years, the utilization of the Cedar Creek Natural History Area by educators, research workers, and special groups has increased steadily. Progress in administration, management, operations, and land acquisition is described in this paper, and the needs for the future are indicated.

The Cedar Creek Natural History Area represents one of the major accomplishments of the Minnesota Academy of Science in the field of preservation of natural areas. By being joined to the University of Minnesota, this project has come to be of increasing significance to the scientific community of the State. This report brings an earlier accounting (Marshall, 1964) up to date.

Those concerned with programs for natural areas must first consider the basic ecological question as to what are (or were) "natural" conditions? Then, the question as to how these are to be preserved or restored. Such considerations must be predicated on the paradox that, in order for an area to be productive of human values, it should be used in some way by people, and this may alter "natural" conditions.

At Cedar Creek, preservation efforts have included land acquisition, active patrol, fencing, and limiting of access to those with permits only for educational and research purposes. Also, certain management procedures have been carried out so that, in so far as possible, original conditions are being restored. The history of the area, its location in relation to roads and other human intrusions, as well as the exigencies of funding have made this a slow process. I believe we have made real progress in the last five years.

Use of the Area

As shown in Table 1, use of the area has increased considerably. This, I believe, is the result of three things. First, the overall increasing recognition of the need for field training in ecological concepts; second, recognition of the excellence of Cedar Creek research programs; third, use of the headquarters building by special groups.

Educational uses have been primarily by classes from nearby colleges: Macalester, Carleton, Augsburg, St. Thomas, Moorhead State, St. Cloud State, St. Catherine's St. John's and Hamline, and by several departments of the University of Minnesota.

An outstanding program has been the "interim" class to study winter ecology, which was established by Dr. L. D. Frenzel, Jr., of Macalester in 1964 and has been continued by Professor A. J. Jones. Groups of 15 to 20 students have spent 10 to 15 nights over a four-week period at the dormitory and have studied animals and plants in the field under severe weather conditions. Since most of us confine our outdoor work to more pleasant

seasons, we miss both the ecological significance and the beauty of northern habitats during the frigid periods, which these students discovered.

More recently, students in the field biology course in the newly established College of Biological Sciences have spent successive Saturdays during spring quarter reviewing research projects at Cedar Creek. In this way students who are oriented towards molecular biology have been exposed to the potentials for fundamental research of a quantitative nature under field conditions.

Another interesting class use has also had a habitat restoration objective. Dr. Frank Irving, School of Forestry, has initiated and carried out a prescribed burning program to restore and maintain oak-savannah areas near Fish Lake and within the project area. Twenty to thirty seniors in forestry and wildlife management carry out this operation under his direction during the spring quarter.

High school groups from Minneapolis and its northern suburbs also have made brief visits to habitats in the area. Since it is difficult for teachers to schedule small group trips for an entire afternoon, some problems have arisen in this connection. It is difficult, for instance, to handle a group of 70 without regularly documented exhibits or nature trails.

Smaller Groups Preferred

During this five-year period no application for an educational visit has been refused. The advisory com-

TABLE 1 — Approximate number of visitors and type of uses at the Cedar Creek Natural History Area — 5 year period

	1963	1964	1965	1966	1967
No. Persons Visiting ¹ . . .	850	875	1049	1050	1470
Collegiate classes . . .	650	700	672	550	800
High School classes . . .	...	...	128	100	180
Individuals	150	175	172	250	250
Special Groups	50	...	77	150	240
No. Colleges/					
U. of M. Depts.	6/5	7/5	6/5	8/3	6/3
No. High Schools . . . . .	...	...	5	3	6
Research Permits ²	32	38	61	59	53
Research Projects	15	12	10	9	10

¹ Based on signatures in log book at Headquarters Building, and probably somewhat lower than actual visits. A majority of the individual visits did not involve field work. Most class groups spent one-half day on field trips. Most special groups met in the laboratory with a short field trip, usually on tie walks to Cedar Bog Lake.

² Since 1964 one-third of the permits have been for workers at the laboratory or waterfowl pens. Few, if any, field trips were involved in this period.

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mittee has recommended that the size of visiting groups be limited to 20. This may work hardships on high school biology teachers, but it is essential to preservation of the area. Also, it is undoubtedly necessary for effective instruction under field conditions.

Special groups have included faculty of University departments, the first national meeting of the *Organization of inland Biology Field Stations*, the fall meeting of the *Minnesota Academy of Science* and local 4-H and church groups which have been at the headquarters building. Meetings of groups such as these contribute to the understanding of the Area by the public and to the information available to members of scientific organizations.

Signatures of individuals in the Area's visitor's book read like a combined Who's Who of scientific organizations worldwide, a listing of citizenry of the State of Minnesota, and a cross section of college and university students who have learnings towards ecology.

The many and varied research programs on the Area over a five-year span can hardly be summarized adequately in a brief report, but the list of 51 publication titles since the 1963 report will provide at least a glimpse of the accomplishments.

The work on ecosystems, a natural development of the pioneer project by Lindeman on Cedar Bog Lake, has been carried out by Dr. Donald B. Lawrence, Dr. Roger Bray, and more recently by Dr. William Reiners and Dr. Eville Gorham and their students. Their many publications, as well as those of Dr. F. M. Swain, form a vital framework for studies on the Area.

The radio-telemetry project, initiated by Dr. Dwain W. Warner and now carried on with Dr. John R. Tester and associates, also has attracted worldwide attention. The two towers with rotating yagi and additions to the original garage-shop building are important and obvious facilities. Studies on a wide variety of mammals as well as hawks and owls have been carried out utilizing these installations. Lack of disturbance by human beings has been an important factor in the results.

Another behavior project which depends on the basic values of isolation available in the Area involves studies on waterfowl and rails. Dr. Frank McKinney, working with Dr. Tester, was looking for a site where the noise of traffic and disturbance by humans would be minimal. He was, in short, a fugitive from "noise pollution." The advisory committee agreed that the construction of large flight pens could be allowed on the western edge of the Area although they modify the habitat. An old field was zoned to permit this construction. Detailed studies based on manipulated population densities of shoveler ducks, green winged teal, and rails using modern recording equipment such as motion pictures with sound tracks are being carried on here. A newer project with Dr. Richard Phillips will study brain stimulation in mallard ducks.

A most interesting series of projects involving the "properties of the ionosphere" and "micro impulses of the earth's magnetic field" have been carried out from a central site on the Area. Here scientists from the U. S. Department of Commerce, Department of Physics, and the Honeywell Research Center have installed receivers

and recording equipment in a small trailer and hut over a period of several years. These projects were essentially avoiding "electronic pollution" and demonstrate again the wisdom of establishing and maintaining a sizeable natural area close to research institutions most likely to be found in a metropolitan complex. These modern research programs are complex, requiring sophisticated equipment and team approaches.

On the other hand, many studies have been carried out by individuals. These have involved microclimates in a bog, ruffed grouse activity, bog habitat and vegetation factors, plants invading old fields, surveys of the flora and avifauna of the Area, ecology of the mud minnow, analysis of wetland plant communities, physiology of white tail deer, the ecological niche of leptospores, bark moisture in aspen trees, chlorophyll and carotenoid pigments and other interesting natural history and ecological processes going on in the Area.

We must, I believe, encourage both the individual worker and the team approach by continued planning.

Administration and Management

The true and lasting values of the Cedar Creek Natural History Area, of course, lie in the three purposes to which it is dedicated: preservation, research, and education. To realize these values, the framework of operations and management is necessary and deserves a brief description. This framework should be viewed in the light of the limitations on time and energy among persons involved, and the exigencies of funding in education and research.

The advisory committee, which includes three Academy members—Drs. William Downing, David Grether, and Dale Chelberg—is now chaired by Dr. Donald B. Lawrence and has continued to function. All proposed research projects have been reviewed by members of the Technical Subcommittee. Changes in management or in needs for acquisition have been discussed by the Management Subcommittee. The Promotion and Fund Raising Subcommittee has not been activated. However, finance problems have been vigorously attacked with the support of University of Minnesota Vice Presidents Stanley J. Wenberg and Laurence R. Lunden, as well as Deans Sherwood O. Berg, Richard S. Caldecott, and Bryce Crawford.

Management of the Area is under the supervision of Dr. James L. App of the Institute of Agriculture. Alvar Peterson, resident manager, handles the day-to-day affairs with abiding interest and devotion to the project. as Director, I work closely with these two men. Currently expenditures by the University in this phase total about \$35,000 per year.

Joint Program With Itasca

In 1966 a Field Biology Program was established in the College of Biological Sciences at the University. This program incorporates the Itasca Biology Sessions and the Cedar Creek Natural History Area. Included are the positions of Director, Biometeorologist (which was filled in 1965-66 by Dr. Aaron Moen), teaching assistant (who

acts as guide to the educational trips and works on records at the laboratory), and secretary (who keeps files, etc. in the St. Paul office). The budget for this phase of operations at Cedar Creek is now almost \$20,000 per year.

A most important aspect of the program has been the willingness of the University administration to assist with financing of crucial but non-recurring needs. A review of special allotments received 1963 through 1966 indicates an average expenditure of almost \$15,000 per year. In 1966, when an emergency situation developed over purchase of a piece of property, Mr. Lunden was more than helpful in meeting the need.

While this summary indicates real progress, it must still be viewed in the light of needs which are still present. All of us are hard-pressed for time and money to support burgeoning research and educational programs. Cedar Creek is no exception, but its needs will continue to be explored and demonstrated.

Progress in Operations

There has, of course, been progress through the past five years in matters other than administration.

Creation of the Field Biology Program certainly has been a major step forward, and Mr. Peterson has been promoted to a position more indicative of his real responsibilities.

In 1963 and 1964 the mapping and weather station projects, made possible by NSF grant G-6162, were completed with the help of Dr. A. C. Hodson. A year later Alan Sargent of the radio-telemetry project created another especially useful cover type map of the Area.

A small library, made possible by donations from the family of the late Arthur N. Wilcox, has been established at the Laboratory.

Expansion of Physical Facilities

Additions to the shop with space for six individual offices have been made. Railroad tie walks to Cedar Bog Lake and Beckman Lake have facilitated field trips by classes, special groups, and research workers. Old ditches which affected water levels in two marshes have been plugged, seven farmsteads have been eliminated with co-operation of the East Bethel Volunteer Fire Department, the road and parking area at the laboratory have been blacktopped and fencing has been completed on new areas. Five houses are being rented and maintained on the Area, and many other small improvements have been made. Approximately 160 acres are being rented each year to maintain open fields for research workers. Under the direction of Professor Jesse Fant, certain boundaries have been carefully surveyed by students in Civil Engineering.

Land Acquisition

With the objective of completing purchases to boundaries formed by roads and powerlines, six tracts encompassing 376 acres were purchased in 1963, 1964, and 1965. Funds available from the original Max C. Fleischman Foundation Grant have been exhausted.

Two other tracts, amounting to 57 acres and including three homes, became available in 1966 and were purchased with special allotments from the University. In 1967 representations were made to the Minnesota Outdoor Recreation Commission with the help of Professor John Borchert and Vice President Wenberg. An allotment of \$103,000 from funds created by the one cent cigarette tax was obtained from the 1967 Legislature. Money thus obtained has been applied toward purchase of land on the east shore of Fish Lake, and purchases have been completed except for a 3-acre tract. Thus, Fish Lake will be the only large lake near the Twin Cities that can be protected from pollution by summer cabin or recreational developments.

In conjunction with these appropriations an application was made to the Department of Conservation for support from Land and Water Conservation funds, which are administered by the Bureau of Outdoor Recreation in a "matching fund" federal program. The first request, made in 1967 for \$28,140, has been approved.

A nature trail will be established on the east shore of Fish Lake, which is quite isolated from the rest of the Area, to allow use by the general public.

Another important phase of progress has been in relations with the surrounding community. Three meetings have been held with community leaders for discussion of programs for the Area. A payroll summary of persons living near Cedar Creek and working on the Area demonstrates that it is one of the major "industries" in this vicinity.

Needs for the Future

Further improvements and consolidation of gains are still imperative, with acquisition of 9 tracts to create a solid block of land filled out to county roads on the south and west being most important. Fencing and posting of the new boundaries will, of course, be necessary.

There is a possible overriding threat to the area in proposals for a major airport in Isanti county, and string representations are being made to the Metropolitan Airport Commission regarding this.

The planning and information services available to educators and research workers who wish to utilize the unique values of the Area require improvement, to which end meetings of college staff are being planned. The files and the system of recording research information and such things as plot locations need a thorough overhauling, and weather station procedures and data processing also must be updated.

In order to accomplish these objectives, additional staff is required, including a biometeorologist for work on the weather station, an assistant to Manager Peterson, and a civil service worker for record keeping.

Summary

Educational uses of the Cedar Creek Natural History Area have increased, major team research programs as well as fine individual efforts have been carried out, important administrative improvements have been made along with considerable financial backing from the Uni-

versity, there has been steady progress in management and acquisition programs. Continued interest and support of the Academy is essential to further progress.

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