

Minnesota Department of Natural Resources
Division of Ecological Resources

SCIENTIFIC AND NATURAL AREAS PROGRAM

Long Range System Plan

October 2004

Background

The Minnesota legislature first authorized the designation of scientific and natural areas (SNA) by the Department of Natural Resources (DNR) in MN Stat 169, Section 84.033. The Outdoor Recreation Act, (MN Stat 86A.05, Subd. 5) specifies the role of SNAs as a component of Minnesota's outdoor recreation system.

Goal

In keeping with the legislative mandate of the Outdoor Recreation Act of 1975, the DNR has established a goal for the SNA system. This goal is:

TO PRESERVE AND PERPETUATE THE ECOLOGICAL DIVERSITY OF MINNESOTA'S NATURAL HERITAGE, INCLUDING LANDFORMS, FOSSIL REMAINS, PLANT AND ANIMAL COMMUNITIES, RARE AND ENDANGERED SPECIES OR OTHER BIOTIC FEATURES, AND GEOLOGICAL FORMATIONS, FOR SCIENTIFIC STUDY AND PUBLIC EDIFICATION AS COMPONENTS OF A HEALTHY ENVIRONMENT.

Policy

The Commissioner of the Department of Natural Resources established the SNA policy (7/6/79) based on the Outdoor Recreation Act of 1975. This policy set forth guidelines for identification and evaluation, designation and registration, management and uses of SNAs. The SNA Program of the Division of Ecological Resources is responsible for the implementation of this policy.

A statewide inventory will be maintained to ensure that all potential SNAs are identified. The conservation efforts of groups, agencies, and individuals will be supported and encouraged.

Identification and Evaluation

The commissioner established an advisory committee (CAC) for the SNA program in 1965. The fifteen-member volunteer committee composed of experts in the biological and geological fields and interested citizens make recommendations to the DNR on proposed SNAs.

The Natural Heritage Program (NHP) within the Division of Ecological Resources is responsible for maintaining data on occurrences of natural features and for the development of Element lists (see Table 1) which identify plant and animal species and natural features considered to have statewide priority for protection. This effort was accelerated through the Minnesota County Biological Survey (MCBS) effort, a county-by-county inventory of biological features initiated in 1987. In addition, the NHP/CBS conducts a preliminary evaluation of each nominated SNA to determine if any Elements occur within the boundaries of the proposed area.

Based on the information and recommendations of CAC and NHP, the SNA Program will recommend to the commissioner that a given area be designated as an SNA.

Registration and Designation

Before an area can be designated, the DNR must: hold title, purchase, or obtain a lease or easement. A commissioner's order filed with the secretary of state makes the designation of an area official.

If an area is privately owned, the landowner will be notified and with the landowner's consent and cooperation, the area may be purchased by the state. Registered areas are public lands where acquisition and designation of an area may not be pursued because legal constraints preclude such action, because the protection of the biological resources do not require designation to ensure they are perpetuated, or because it is not possible. In this case, the area remains entirely in the original ownership. The SNA program will have no legal or financial obligations for management of the tract.

If an area is owned by city, county or federal levels of government or owned and managed by the DNR Division of Fish and Wildlife as a wildlife management area, an inter-agency agreement will be sought to attempt to ensure adequate protection and management.

In such a situation, if a written agreement negotiating protection of a qualified area can be secured between the SNA Program and the managing agency or individual, it may be more prudent to leave the area registered, rather than pursue designation since securing a legal interest in lands of another government unit is a difficult and lengthy process.

Management and Use

DNR policy and Outdoor Recreation Act of 1975 state that a management plan should be written for each designated SNA before development occurs. These management plans will conform to the policy established by the commissioner in 1979. In addition Minnesota Rules (6135.4500-6135.5000) will be enforced on all designated SNAs.

Protection Objectives

1. To protect through SNA designation up to three occurrences of each of the following Elements: Plants, Animals, Geological Features, or Other Special Features within each landscape region (subsection) where they occur. Other occurrences may be registered

(see Table 1 below).

2. To protect through SNA designation up to five occurrences of each Plant Community Element within each landscape region (subsection) where they occur. Other occurrences may be registered.

TABLE 1

Element List

The NHP uses the term Element to identify outstanding natural features and species that have priority for protection. These Elements are of particular concern on a national or statewide basis because they are: (1) rare or threatened plant or animal species or (2) uncommon, threatened, or particularly noteworthy examples of plant communities, geologic features, or other special features. For example: the Minnesota trout lily, the piping plover, oak savanna plant communities, eskers, or patterned peatlands.

Elements - Lists were developed through intensive review of pertinent literature, museum and private collections, and discussions with knowledgeable individuals.

Plants - Vascular and nonvascular plant species considered to be rare or threatened in Minnesota. In most instances they are represented by fewer than five occurrences in the State.

Animals - Vertebrate and invertebrate animal species considered to be rare or threatened in Minnesota.

Geological Features - Geologic features identified as being protection priorities because the feature is either uncommon, threatened, or noteworthy on regional basis.

Other Special Features - This includes natural features that are protection priorities, but do not fit into categories discussed above. Currently this includes avian colonial nest sites and patterned peatlands.

Plant Communities - native plant communities identified as being protection priorities because the community is uncommon, threatened, or particularly noteworthy in Minnesota.

Additional Element lists may be developed by the NHP or the SNA Program to catalogue features discussed as priority in the SNA Policy, but not currently included in the existing Element lists.

Rationale

There are too many species that comprise the state's biological diversity to deal with them all on an individual basis, therefore, it was necessary to establish a classification system that would serve as both a coarse and a fine "filter." The coarse "filter" sorts out the plant community Elements and the fine "filter" sorts out the individual species or natural features.

Each of the identified plant community Elements sorted out through the coarse filter is

comprised of characteristic species. Therefore, if communities are identified and preserved, the species most commonly associated with them will be preserved.

Those species or natural features sorted out by the fine filtering process comprise only a fraction of the state's natural diversity. They must be dealt with on an individual basis because they are not predictably associated with any one community type.

For all Elements it is necessary to protect more than one occurrence for the following reasons:

To prevent severe damage or loss of an occurrence of an Element resulting from:

1. Land-use conflicts (public need may preclude SNA designation).
2. Accidental abuse (herbicides, oil spills, mismanagement).
3. Deliberate abuse (overuse, vandalism).
4. Natural catastrophe (disease, storms).

To provide a sufficient number of natural areas for research and educational uses by:

1. Dispersing users thereby decreasing the impact on any one natural area.
2. Increasing the proximity of natural areas to potential users.

To allow for biological replication of Elements by:

1. Protecting general variants of species at intervals along environmental gradients.
2. Protecting sufficient area to meet habitat requirements of species.

It is necessary to designate up to five occurrences of plant community Elements within a given subsection because plant communities protect: subtle differences and interactions between species; a diversity of common and uncommon organisms; and finally, aspects of an ecosystem which humans don't even yet understand. Designation of up to three occurrences of an individual species or features is currently thought to be sufficient to ensure protection and perpetuation of these elements. Through this designation process, outstanding examples of the major portion of the biological diversity of the state will be preserved.

Discussion

The long-range objectives are based on the need to protect an acreage base sufficient to ensure the maintenance and perpetuation of examples of all of Minnesota's remaining natural Elements. It was expected that in order to reach this objective approximately one-tenth of one percent of the state or 52,000 acres would be necessary to be protected in a system of designated scientific and natural areas. This figure was established in 1981, in part, by estimating the availability of quality natural areas existing in each of the landscape regions in the state at that time. However, in some landscape regions this may be unattainable. For example, the Coteau des Prairie was once all prairie. One-tenth of one percent of the region comprises nearly 3,000 acres. It is improbable this number of acres of natural prairie remains today. Since 1987 the Minnesota County Biological Survey has been conducting systematic surveys of the state. This effort has generated quantifiable information on plant and animal species and community occurrences that today serve as the basis for identification of potential

natural areas. A more realistic approach to natural area protection is to focus on the number of sites to be protected for elements across the landscape and range of an element occurrence. A site is established based on the extent of the element occurrence at any one location as well as necessary buffers to protect the element occurrence from outside influences.

Because there is little land remaining in its natural state and based on the history of other state natural state programs in 1981, the expectation that one-tenth of one percent of the state needs to be protected in a scientific and natural areas system was a reasonable and realistic long-range objective. However, the experiences of other states, the accelerating number of rare species, and the experience of Minnesota since 1981 indicate that this goal is too low. The MCBS work has demonstrated that so little remains in the southern part of the state for instance that establishing a goal to protect every site of statewide significance in the southern part of the state is a more realistic goal. In the heavily forested area of the state, which is primarily north and northwest of the metropolitan area of the Twin Cities, a goal to protect at least five examples of natural communities and at least three sites for rare species and geological features of statewide significance in each subsection is still realistic.

An analysis of the numbers of elements in need of protection and their known historical distribution coupled with the stated objectives of protecting multiple sites for each element in each subsection permits one to project a probable number of natural areas ultimately needed. Based on this assessment in 1985 it was projected that Minnesota would need to establish a system of 500 natural areas by the year 2085 in order to adequately protect all elements of biological diversity in the state. Based on the historical occurrences of elements approximately 200 sites are projected to occur in the prairie biome. Prairie at one time occupied 18,000,000 acres. Today it is estimated less than 1% of the prairie community remains. The deciduous forest biome is projected to need approximately 135 SNA sites with the northern coniferous biome requiring 165 sites.

Implementation

The protection and designation process utilizes a Protection Status Matrix for the Element lists developed by NHP, and a set of criteria for ranking priorities. The Protection Status Matrix is used to illustrate which elements in a landscape region are adequately protected, and to monitor the status of attaining our element protection objectives.

Elements that occur on designated SNAs, federal research natural areas, and federal and state wilderness areas are considered adequately protected because of both the strong legal and management protection granted to this type of managed areas. Elements that occur in public or privately owned land but receive no protection and/or are managed in a manner that conflicts with SNA policy are inadequately protected. Partial protection may occur on lands in natural state parks, wildlife management areas and on lands owned by other government or private groups that manage the land in a natural condition. However, since these areas are managed under different policies and for different management objectives, elements protection may not be the primary focus. By using the matrix, the number of sites which are adequately protecting a given Element in a given landscape region can be determined and monitored. For example, the matrix might show Element X in three protected areas, Element Y in two protected areas, and Element Z in no protected areas. In this manner, the matrix illustrates which Elements are

most in need of protection. In addition, the matrix helps the Heritage Program to identify those potential SNAs discovered that contain the greatest number of unprotected Elements.

Using this matrix, potential SNAs are selected for possible designation. The following criteria are used in ranking these areas:

1. Rareness of Elements present in an area on a national or state scale.
2. Excellence and completeness of Element occurrences found in an area.
3. Degree to which an area or its Element are threatened with incompatible use.
4. Degree of protection afforded similar Elements elsewhere in the landscape region.
5. The adequacy of representation of Elements in terms of genetic diversity.

For the most part this ranking will be accomplished by the NHP assigning priorities to Elements on the Element list. This information is today based almost exclusively on the data generated through the on-going inventories of the Minnesota County Biological Survey. Following this SNA staff and CAC will prioritize potential areas for designation by taking into account such considerations as:

1. Feasibility of managing the area.
2. Availability of the area.
3. Funding for acquisition, maintenance, and operations.
4. Established research and educational use.

As Elements are protected through SNA designation the status of Elements on the matrix will change.

This process is designed to assist the SNA Program in making the most viable decisions in the SNA protection and designation process. However, it is important to note that throughout this long-range plan, the process of identifying potential SNAs cannot always be reduced to a simple formula. In specific instances, scientific judgment may argue that strict adherence to these guidelines will not result in the best possible decisions. This situation might arise when a compelling argument is made regarding inadequacies in the Element lists, shortcomings in the subsection classification system, or cases where a larger number of protected sites is essential for perpetuation of a particular Element. Such overriding considerations will be the exception rather than the rule, but it is important to recognize the need for this type of flexibility.

Budgetary Considerations

The long-range goal of protecting the ecological diversity of Minnesota's natural heritage through establishing a system of scientific and natural areas will provide overall direction for the SNA Program. In this respect ecological parameters will determine the necessary size and number of designated SNAs. Budgetary constraints however may determine the timing of achieving this goal. Costs can be broken down into three categories: acquisition, planning and development, and maintenance and operations. Savings in acquisition costs are apparent when designating SNAs within a state park or other state owned lands. SNAs are also acquired via free-lease, gift, or bargain sale. Wolsfeld Woods SNA is an example of an area received by the

state as a gift in 1979. Acquisition would otherwise have cost the state \$750,000. Wood-Rill Natural Area was acquired as a gift starting 1996 and was appraised at over \$5 million.

Each designated SNA must have a management plan before development of facilities is carried out. The costs of completing an inventory and writing the plan vary considerably. However, past comprehensive planning efforts have provided a blueprint for management needs of prairies, red pine forests, piping plovers and other communities and rare species. This permits the management recipes developed to be used on new sites where the resources are similar. In general, there are few development requirements (facilities) in SNAs. They may include developing interpretive trails and parking facilities. Resource development consists of projects that have long lasting benefits e.g. removal of woody encroachment and herbicide treatment. Protection requirements include posting and fencing boundaries while operations and maintenance costs include prescribed burns, maintenance of trails, monitoring, enforcement, and supervising research and educational activities. As such costs vary considerably per unit.

The SNA program utilizes other agency personnel and volunteer support to the maximum extent possible. In this respect gifts of land also lessen acquisition costs to the state.

Review Process

The long-range plan for selecting scientific and natural areas will be reviewed every 6 years. Element lists will be reviewed at least every three years. The review process will be conducted cooperatively by the SNA Program and the NHP. CAC will review and advise throughout the review process.